MANGINI

**MANGINI ASSOCIATES INC.**
4320 West Mineral King Avenue
Visalia, California 93291
(559) 627-0530

**www.mangini.us**

| | |
|---|---|
| **DATE:** | April 16, 2025 |
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| **OPSC APPL. NO.:** | |
| **DSA APPL. NO.:** | 02-123247 |
| **DSA FILE NO.:** | 16-14 |
| **PTN:** | 63917-60 |

**PROJECT MANUAL FOR:**

# MODERNIZATION AT MONROE ELEMENTARY SCHOOL

## HANFORD ELEMENTARY SCHOOL DISTRICT
## HANFORD, KINGS COUNTY, CALIFORNIA

LICENSED ARCHITECT — JAMES R. MORRELLI — No. C-33128 — REN. 05-31-27 — STATE OF CALIFORNIA

**J. Ryan Morrelli** **C-33128**
**ARCHITECT**
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PHONE: (559) 627-0530 FAX: (559) 627-1926

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REGISTERED PROFESSIONAL ENGINEER — John Atilano — S 5176 — 07/16/2025 — STRUCTURAL — STATE OF CALIFORNIA

**John Atilano** **S-5176**
**STRUCTURAL ENGINEER**
LANE ENGINEERS INC.
979 N. Blackstone Street, Tulare, CA 93274
PHONE: (559) 688-5263 FAX: (559) 688-8893

REGISTERED PROFESSIONAL ENGINEER — WA VANG — R.C.E. 73146 — 07/16/2025 — CIVIL — STATE OF CALIFORNIA

**Wa Vang** **C-73146**
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LICENSED LANDSCAPE ARCHITECT — DAVID W. BRILEY No. 2787 — Signature — 12/31/26 Renewal Date — Date — STATE OF CALIFORNIA

**Dave Briley** **PLA-2787**
**LANDSCAPE ARCHITECT**
BLAIR,CHURCH, & FLYNN CONSULTING ENGINEERS
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IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-123247 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 11/04/2025

SET NUMBER _____

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**SECTION 00 1110 - INVITATION TO BID**

1. **NOTICE TO CONTRACTORS:** The **Hanford Elementary School District**, acting by and through its Governing Board, hereinafter referred to as the Owner, will receive sealed bids for the award of contracts for the construction of the **Modernization at Monroe Elementary School, 300 Monroe Drive, Hanford, California 93230**.

2. **SUBMITTAL OF BIDS:**
   - **.1 Sealed Bids:** Sealed envelopes containing bids with subcontractor's list and other required attachments will be accepted by **Hanford Elementary School District** at its offices located at **714 North White Street, Hanford, California 93230** on **January 14, 2026** before **3:00:00 pm PST** on the clock designated by the Owner or its representative as the bid clock.
   - **.2 Completed DIR Information:** Within 24 hours of the opening of the bids, the apparent low bidder shall submit completed DIR information on the Subcontractor List to t **Hanford Elementary School District** at its offices located at 714 North White Street, Hanford, California 93230.
   - **.3 DVBE Information:** Within 24 hours of the opening of the bids, the apparent low bidder shall submit the Prime Bidder Good Faith Effort Worksheet and Prime Bidder Certification of Disabled Veteran Business Enterprise Participation forms to the **Hanford Elementary School District** at its offices located at 714 North White Street, Hanford, California 93230.

3. **OPENING OF BIDS:** Bids will be opened and read aloud after **3:00:00 pm PST, January 14, 2026.**

4. **MANDATORY PRE-BID CONFERENCE:** A pre-bid conference has been scheduled for **December 10, 2025**, at **3:30 pm**, at the project site, 300 Monroe Drive, Hanford, California 93230, and will include the opportunity to inspect the site and may include dissemination of additional information in response to questions or otherwise. All bidders will be deemed to have notice of all conditions and information which bidders could have obtained by attending the pre-bid conference, including but not limited to any conditions in, at, and about the site, the building or buildings, if any, and any work that may have been done thereon. Bids will not be accepted from bidders who did not attend the pre-bid conference.

5. **DESCRIPTION OF WORK:** The Work includes alterations to (6) existing classroom buildings and miscellaneous site work for accessibility upgrades and site improvements, including overhaul of existing service yard, relocation of (1) existing relocatable building, disconnecting and safe-off of (5) existing relocatable buildings, abandonment of existing irrigation well, and connection of new water main line and meter.

6. **BASIS FOR BIDS:** Bids shall be on a lump sum basis.

7. **TIME OF COMPLETION:** The Work shall be completed within **419 calendar days** from the date of the Owner's Notice to Proceed.

8. **EXAMINATION AND PROCUREMENT OF CONTRACT DOCUMENTS:** Contract Documents have been prepared by Mangini Associates Inc. Documents may be examined and obtained at the Architect's office, 4320 West Mineral King Avenue, Visalia, CA 93291, (559) 627-0530, Monday through Thursday between 8 am and 5 pm and Friday between 8 am and 12 pm or at Dodge Data & Analytics, ConstructConnect, Tulare-Kings County Builders Exchange (Visalia), the Central California Builders Exchange (Fresno), Kern County Builders Exchange (Bakersfield), Builders Exchange of Stockton. The architect's contact for questions or RFI's is **Manuel Acosta at manuel@mangini.us**

   Digital plan sets are available in .pdf format by contacting Bridgette Young at bridgette@mangini.us

Only bonafide **general contract bidders** may secure hard copies of the proposed Contract Documents from the Architect on the following basis:

**.1** Limited to 2 sets of specifications and drawings, upon payment of **$375.00** deposit per set payable to Mangini Associates Inc., completely refundable if sets are returned to the Architect in good condition within 7 calendar days after bid opening.

**.2** A non-refundable charge of **$20.00**, made by separate check, will be required for all sets requiring shipping and handling.

**.3** Additional complete sets may be purchased from the Architect at the price of 1.15 times the Architect's cost of reproduction and delivery.

**.4** Specifications and drawings will also be issued to various Builders Exchanges for subcontractors' use or subcontractors may purchase complete sets from the Architect at the price of 1.15 times the Architect's cost of reproduction and delivery. **Purchased sets are non-refundable.**

**.5** No partial sets or individual sheets will be issued or sold.

**.6** Only plan holders and the listed exchanges will be notified of Addenda.

**9. SUBSTITUTIONS:** Pursuant to California Public Contract Code Section 3400, contractors and material suppliers shall submit requests to the Architect, not less than 10 days prior to bid (if material is to be included on final addendum), all data substantiating a request for substitution of materials. In order to be considered, substitutions of materials or equipment must comply with the requirements of specification Section 01 2500, including providing comparative data and samples.

Pursuant to Public Contract Code, Section 3400, Subdivision (b)2, no substitutions will be permitted for the following items which the Owner has determined are required in order to match products in use on improvements throughout the District:

**.1** Door Locks and Latches specified in Section 08 7100: Schlage (Owner's standard)

**10. BID SECURITY:** Submit bid security with proposal, made payable to Owner, in amount of 10% of the Bid, in the form of certified check, bid bond, cashier's check or cash. Bid security will be retained until Agreement is signed and required bonds furnished. If any bidder refuses to sign the Agreement Form within 7 days after Award, the Owner will retain his bid security as liquidated damages. To enable compliance with California Code of Civil Procedure Section 995.311, each contractor shall provide, prior to Contract Award, a print-out of information from the Department of Insurance website http://www.insurance.ca.gov/ confirming the surety is an admitted surety insurer.

**11. QUALIFICATION OF BIDDER:** The Owner will not consider or accept any bids from contractors or subcontractors who are not licensed to do business in the State of California, in accordance with the California Public Contract Code of the State of California, providing for the licensing of contractors. In accordance with Section 3300 of said Code, the Contractor shall have a **Class B license** and shall maintain that license in good standing through Project completion and all applicable warranty periods.

**12. AWARD:** The Owner reserves the right to reject any and all bids and/or waive any informality in any bid received and/or determine in its discretion the responsibility of any bidder, and which bid is most advantageous to the Owner. Unless otherwise required by law, no bidder may withdraw his bid for a period of **60 days** after the date set for the opening thereof, or any authorized postponement thereof. The Owner reserves the right to take more than 60 days to make a decision regarding the rejection of bids or the award of the Contract.

**13. PREVAILING WAGES:** The Project is a public work and under California Labor Code Section 1770 et seq., the Director of the California Department of Industrial Relations ("DIR") has determined the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which the work is to be performed, for each craft, classification or type of worker needed to execute this Contract. Copies of the rates are on file at the Owner's principal office. It shall be mandatory upon the Contractor and on any subcontractor to pay not less than the said specified rates to all workers employed in the execution of this Agreement.

**14. DIR REGISTRATION:** The Owner will not accept any bid or enter into any contract without proof of the bidder's current registration to perform public work under Labor Code Section 1725.5. Bidders shall not accept any subbid or enter into any subcontract without proof of the subcontractor's current registration to perform public work under Labor Code Section 1725.5.

**15. LABOR COMPLIANCE:** Contractor and all subcontractors shall comply with Labor Code Section 1776. In accordance with Labor Code section 1771.4(a)(1), the Project is subject to compliance monitoring and enforcement by the DIR. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner on a monthly basis, unless directed by the Owner to furnish such records more often, and in the format prescribed by the Labor Commissioner.

**16. RETENTION FUND:** The successful bidder will be allowed to substitute securities or establish an escrow in lieu of retainage, pursuant to Public Contract Code Section 22300, and as described in the Agreement Between Owner and Contractor and General Conditions.

**17. REQUIRED CERTIFICATIONS:** Bids must be accompanied by the following forms, fully executed by each Bidder:

**.1** Non-Collusion Affidavit
**.2** Contractor's Certificate Regarding Workers Compensation
**.3** Fingerprinting Notice and Acknowledgment
**.4** Sufficient Funds Declaration
**.5** Acknowledgment regarding Drug Free Workplace
**.6** Acknowledgment regarding Alcoholic Beverage and Tobacco-Free Campus Policy
**.7** Acknowledgment regarding No Contracting with Sanctioned Entities
**.8** Roof Project Certification.
**.9** Prime Bidder Good Faith Effort Worksheet and Prime Bidder Certification of Disabled Veteran Business Enterprise Participation.

**18. DSA OVERSIGHT PROCESS:** The Contractor shall comply with the applicable requirements of the Division of State Architect ("DSA") Construction Oversight Process ("DSA Oversight Process"), including but not limited to (a) notifying the Project Inspector upon commencement and completion of each aspect of the work as required under DSA Form 156; (b) coordinating the Work with the Project Inspector's inspection duties and requirements; (c) submitting verified reports under DSA Form 6-C; and (d) coordinating with the Owner, Owner's Architect, any Construction Manager, any laboratories, and the Project Inspector to meet the DSA Oversight Process requirements without delay or added costs to the Project.

**19. DVBE REQUIREMENTS:** The Owner will require the successful Bidder to achieve the minimum goal of 3% DVBE (Disabled Veteran Business Enterprises) established in the bidding documents or to provide acceptable evidence of good faith efforts to do so.

**20. PRE-QUALIFIED BIDDER LIST:** Pursuant to Public Contract Code Section 20111.6, subsections (b) through (m), all general contractors and mechanical, electrical and plumbing subcontractors in license classifications A, B, C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C- 42, C- 43 and C- 46 who intend to bid on the project must be pre-qualified. No bid will be accepted for such projects from subcontractors in the listed license categories that are not on the Owner's Qualified Bidder List. Prequalification application packages are available on the District's website or at the Owner's main office. Prequalification applications must be submitted to the Owner by **2:30 pm, December 12, 2025.** The Owner will publish a list of qualified bidders on or before **December 17, 2025.**

Dates Advertised: December 3, 2025 December 10, 2025

BY ORDER OF THE BOARD OF TRUSTEES OF
HANFORD ELEMENTARY SCHOOL DISTRICT

**END OF SECTION 00 1110**

## SECTION 00 2110 - INSTRUCTIONS TO BIDDERS

### PART 1 - CONTRACT DOCUMENTS

**1.1** **Securing Documents:** Secure copies of the Contract Documents at the office of the Architect upon the conditions set out in the Section 00 1110 - Invitation To Bid.

**1.2** **Examination of Documents and Site:** Before submitting bid, carefully examine the Contract Documents and visit the site of the Project. Observe existing conditions and limitations under which the Work is to be performed and include in bid a sum to cover cost of all items necessary to perform the Work. Contractor will not be entitled to extra payment due to existing conditions, if such conditions could have been observed upon the required site visit and examination of Documents.

**1.3** **Interpretation of Contract Documents Prior to Bidding:** In general, the Drawings show dimensions, position, and kind of construction, and the Specifications qualities and methods. Any work called for on the Drawings and not mentioned in the Specifications, or vice versa shall be furnished as though fully set forth in both. Work not particularly detailed, marked or specified shall be the same as similar parts that are detailed, marked or specified.

- **.1** It is the intent of the plans and specifications that the Contractor shall turn over to the Owner a complete job. Any work not specifically called for or specified, but necessary to comply with the intent of quality and completeness shall be performed as part of the contract.
- **.2** If any person contemplating submitting a bid for the construction of the Work is in doubt as to the true meaning of any part of the Contract Documents or finds discrepancies in or omissions from any part of the Contract Documents, he may submit to the Architect a written request for an interpretation thereof not later than 7 days before bids will be opened. **A Pre-Bid Request for Information form is included at the end of this Section.**
- **.3** Address all communications regarding this work to the Project Architect as shown on the cover page of the Project Manual.
- **.4** The person submitting the request will be responsible for its prompt delivery.
- **.5** **Any binding interpretation or correction of the Contract Documents will be made only by written Addendum** and will be mailed or delivered to each Bidder on record. The Owner will not be responsible for any other explanations or interpretation of the Contract Documents.

**1.4** **Substitutions:** Contractors, subcontractors and/or material suppliers shall comply with the requirements set forth in Specification Section 01 2500 - Substitution Requirements. All requests for material substitutions shall be submitted with all required substantiating data, comparisons to the material specified, including samples and colors as needed to determine their acceptance. Failure to provide the required documentation is justification for rejection.

- **.1** Substitution Requests shall be submitted a minimum of 10 days prior to the bid (if material is to be included on the final addendum);
- **.2** or not more than 35 days after the award of the contract.
- **.3** Substitution Requests received greater than 35 days after the award shall be rejected.

**1.5** **No Substitution Items:** Pursuant to Public Contract Code, Section 3400, Subdivision (b)2, no substitutions will be permitted for the following items which the Owner has determined are required in order to match products in use on improvements throughout the District:

- **.1** Door Locks and Latches specified in Section 08 7100: Schlage (See Owner's standard)
- **.2** Fire Alarm System specified on the Drawings.

**1.6** **Addenda:** Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Contract Documents by additions, deletions, clarifications, or corrections.

### PART 2 - BASIS FOR BIDS:

**2.1** **Lump Sum Bid:** All bids shall be on a lump sum basis. Each bidder shall breakdown the lump sum into the items required on the bid form, if any.

**2.2** **Taxes:** Taxes shall be included in the bid prices. The Owner will pay only the State sales and use taxes. Federal excise taxes are not applicable to school districts.

**2.3** **Alternates:** All alternates shall be bid by inserting the amount to be added or deducted in the appropriate space on the bid form. Alternates are described in Section 00 2410 - Scopes of Bids and on the drawings. Alternates are additive or deductive to the total lump sum bid. If no change in the base bid is required, enter "No Change.

**PART 3 - BIDDING PROCEDURES**

**3.1** **Bid Form:** In order to receive consideration, make all bids in accordance with the following:

**.1** Make bids on the form provided with all blanks filled in. Do not change form wording nor add words.

**.2** All amounts shall be in words as well as in figures. Any discrepancy between the words and figures shall be resolved using the amount stated in words.

**.3** The Bid Form shall be filled out in ink or be typewritten.

**.4** A bid which is incomplete, incorrect or non-conforming, may be disregarded, in the sole discretion of the Board of Trustees.

**.5** Changes in or additions to the bid form, recapitulations of the work bid upon, alternative proposals, or any other modification of the bid form which is not specifically called for in the Contract Documents may result in the Owner’s rejection of the bid as not being responsive to the Invitation to Bid. Bids expressing exceptions or qualifications on Technical Specifications shall be disregarded as non-responsive.

**.6** The bid submitted shall not contain erasures, interlineations, or other corrections unless each such correction is suitably authenticated by affixing in the margin immediately opposite the correction the surname or surnames of the persons signing the bid. Oral or telephonic modifications of any bid submitted will not be considered.

**.7** Each bid shall be delivered in a separate opaque sealed envelope bearing on the outside, the name of the bidder, the bidder’s address, and the name of the Project. Each envelope shall include all the documents required by these Instructions.

**.8** Bids may not be modified after the designated time for bid opening. Bidders may withdraw and resubmit bids at any time prior to bid opening. No bid may be withdrawn after the bid opening.

**.9** Late bids will be returned to Bidder unopened.

**.10** Address bids to Owner and deliver to Owner on or before time set in Invitation to Bid. Enclose bid in sealed envelope bearing title of the Project and name of Bidder.

**.11** It is the Bidder's responsibility to be certain his bid is received in time at the proper place.

**3.2** **Execution of Forms:**

**.1** Each bid must give the full business address of the bidder and must be signed by the bidder with his or her usual signature in longhand.

**.2** Bids by partnerships must furnish the full names of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters.

**.3** Bids by corporations must be signed with the legal name of the corporation, followed by the signature and designation of the president, secretary, or other person authorized to bind the corporation in this matter. The name of each person signing shall also be typed or satisfactory evidence of the authority of the officer signing on behalf of the corporation shall be furnished.

**.4** A bidder's failure to properly sign required forms may result in rejection of the bid.

**.5** All bids must include the bidder’s contractor’s license number, classification, and expiration date.

**3.3 Bidder Submittal Envelope:** All responsive bidders shall provide the following items within the Bid Submittal Envelope:

- **.1** Bid Form
- **.2** Bidder's Bond
- **.3** Subcontractor List
- **.4** Non-Collusion Affidavit
- **.5** Contractor's Certificate Regarding Workers Compensation
- **.6** Fingerprinting Notice and Acknowledgment
- **.7** Sufficient Funds Declaration
- **.8** Acknowledgment regarding Drug Free Workplace
- **.9** Acknowledgment regarding Alcoholic Beverage and Tobacco-Free Campus Policy
- **.10** Acknowledgment regarding No Contracting with Sanctioned Entities
- **.11** Roof Project Certification
- **.12** Prime Bidder Good Faith Effort Worksheet and Prime Bidder Certification of Disabled Veteran Business Enterprise Participation.

**3.4 Withdrawal of Bid:** Bidder may withdraw his bid at any time prior to the scheduled time for opening. No Bidder may withdraw his bid for a period of **60 days** after the time and date of opening. All bids shall be subject to acceptance by Owner during this period.

**3.5 Subcontractor List / DIR Information:**

- **.1 Subcontractor List:** Pursuant to the provisions of Section 4100 to 4113, inclusive, of the Public Contract Code of the State of California, every Bidder shall set forth the name and location of the place of business of each subcontractor who will perform work or labor in or about the construction of the Work or improvement in an amount in excess of 1/2 of one percent of the Bidder's total Base Bid. If the Bidder fails to specify a subcontractor for any portion of the work in excess of 1/2 of one percent of the Bidder's total Base Bid, the Bidder agrees to perform that portion of the Work.
- **.2 DIR Information:** Pursuant to Labor Code section 1725.5, within 24 hours of the receipt of bids, every Bidder shall set forth the name, location of the place of business, contractor's license number, and DIR registration number of all subcontractors listed on the Subcontractor List submitted with the Bid. The Contractor and any proposed subcontractors shall not be qualified to submit a bid or to be listed in a bid proposal for the Project unless currently registered and qualified under Labor Code Section 1725.5 to perform public work.

## PART 4 - BONDS, AGREEMENT, AND INSURANCE

**4.1 Bid Security:** Each bidder is required to submit with each bid, a cashier's check upon a solvent bank, or a Bid Bond in an amount equal to 10% of the Bid made payable to Owner. This bid security shall be given as a guarantee that the bidder will enter into the Agreement if awarded to him and **shall be declared forfeited as liquidated damages if he refuses to enter into said Agreement** upon request to do so by Owner. If the bidder fails or refuses to timely enter into the contract, the Owner reserves the right to declare the bid bond forfeited and to pursue all other remedies in law or equity relating to such breach including, but not limited to, seeking recovery of damages for breach of contract. Bid security will be returned to all unsuccessful bidders, and to each successful bidder upon the Owner's receipt of a satisfactory Performance Bond, Payment Bond, Policy of Insurance, Worker's Compensation Insurance Certificate, executed Agreement and any other document required by the Contract Documents prior to the execution of the Agreement by the Owner. Bid Bonds shall be executed on the form included in these specifications or a facsimile thereof. Any and all bonds required, whether Bid Bonds, Faithful Performance, Payment, or other bonds, shall be issued by a California admitted surety insurer.

**4.2 Bid Security and Bond Requirements:** Each successful bidder shall file with Owner, a Performance Bond and a Payment Bond, each in the amount of 100% of the Contract Sum. All bonds required, whether Bid Bonds, Performance, Payment, or other Bonds, shall be issued by a California admitted surety insurer. The Bid Bond, Performance Bond, and Payment Bond must be issued by the same admitted surety insurer. The payment and

performance bonds required by these specifications will neither be accepted nor approved by the Owner unless the bonds are underwritten by an admitted surety The Owner further reserves the right to satisfy itself as to the acceptability of the surety and the form of bond. The apparent low bidder must submit together with the payment and performance bonds the following documents:

**.1** The original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws, or other instrument authorizing the person who executed the bond to do so.

**.2** A certified copy of the certificate of authority of the insurer issued by the California Insurance Commissioner.

**.3** A financial statement of the assets and liabilities of the insurer to the end of the quarter calendar year prior to 30 days next preceding the date of the execution of the bond, in the form of an officers' certificate as defined in Corporations Code Section 173.

**.4** If the surety insurer is not found to be an "admitted surety insurer" the bid shall be determined non-responsive and shall be rejected. If the surety insurer's assets do not exceed its liabilities in an amount equal to or in excess of the amount of the bond, subject to Section 12090 of the Insurance Code; or if the bidder fails to provide the specified documents; the bid may be determined non-responsive and may be rejected.

**4.3 Form of Agreement:** The bidder selected by the Owner shall be required to execute an Agreement in form and substance substantially identical to that included in this bidding package. The Agreement and other documents are subject to the approval of the Owner and its legal counsel. The successful bidder shall, within 7 days of notice of award of the contract, sign and deliver to the Owner the executed Agreement along with the bonds and certificates of insurance required by the contract documents. In the event the bidder to whom an award is made fails or refuses to execute the Agreement within 7 calendar days from the date of receiving notification that the contract has been awarded to the bidder, the Owner may declare the bidder's bid deposit or bond forfeited as damages caused by the failure of the bidder to enter into the contract, and may award the work to the next lowest responsible bidder, or may reject all bids and call for new bids.

**4.4 Worker's Compensation Insurance:** Bidder shall submit with his bid the Contractor's Certificate Regarding Worker's Compensation in the form provided by the Construction Documents. Contractor shall maintain for the duration of his work on this Project statutory Worker's Compensation Insurance.

**4.5 Contractor's Insurance Coverage:** Contractor shall maintain for the duration of the work required under the Agreement, all Insurance in the forms and minimum amounts shown in the Construction Agreement.

**.1** Before an Agreement is executed by the Owner, the Contractor shall obtain all insurance policies required hereunder, including the "GENERAL LIABILITY - ADDITIONAL INSURED ENDORSEMENT"; shall obtain Owner's approval of insurance; and shall file policies of such insurance with Owner. Approval of the insurance shall not relieve or decrease the liability of Contractor.

**.2** Policies of insurance shall contain transcripts from the policies authenticated by proper office of the insurer, evidencing in particular those insured, the amount of the insurance and the location of and the operations to which the insurance applies. The insurance required must be written by a company licensed in California.

**.3** Contractor shall not cause any insurance policy to be canceled or permitted to lapse. Each insurance policy shall contain a clause stating that the policy shall not at any time during the construction period be canceled or reduced, restricted or limited until 30 days after written notice to the Owner and Architect by registered mail, return receipt requested.

## PART 5 - CONSIDERATION OF BIDS

**5.1 Award of Contract:** The Contract shall be awarded to the lowest responsible and responsive bidder as interpreted by the Owner under California law and as specified herein. Rejection of any or all bids, to contract work with whomever and in whatever manner, to abandon work entirely, and/or to waive any informality in receiving of bids is reserved as the right of the Owner. Before the Contract is awarded, the Owner may at its sole discretion, require from the proposed Contractor further evidence of the reasonable qualifications of such contractor to faithfully, capably, and reasonably perform such proposed Contract and may consider such evidence before making its decision on the award of such proposed Contract.

**5.2 Basis of Award:** The lowest bid will be determined in the following manner:

**.1** On the amount of the base bid only.

**5.3 Execution of Agreement:** The required form of Agreement is included in the Contract Documents. The awarded bidder shall execute Agreement within seven (7) days after mailing, faxing or delivery of the Notice of Award of Contract. Owner reserves the right, without any liability, to cancel the award of any bid for any reason at any time before the full execution of the Agreement between Owner and Contractor.

**PART 6 - ADDITIONAL PROVISIONS**

**6.1 Contractor License Required:** The Owner will not consider or accept any bids from contractors or subcontractors who are not licensed to do business in the State of California, in accordance with the Public Contract Code of the State of California, providing the licensing of contractors. Joint venture bidders shall possess a joint venture license. In accordance with Section 3300 of said Code, the Contractor shall be a **Class B license.**

**6.2 Construction Documents for Construction:** A reasonable number of plans and specifications for construction, as stated in 2.2.5 of the General Conditions, shall be **10 sets** furnished to the successful Contractor without charge. Additional sets will be furnished, upon request from the Contractor, at the Architect's cost of reproduction and delivery. All plans and specifications are the property of the Owner and are to be carefully used and returned to the Owner at the completion or cessation of the work or termination of the contract, and are not to be used on other work.

**6.3 Liquidated Damages:** Time is of the essence in the performance of this contract, and all work called for herein and all requirements shall be completed before the expiration of the date established in the Owner's Notice to Proceed. Failure to complete the Project, or applicable phases of the Project, within the date(s) and in the manner provided for by the Contract Documents, shall subject the Contractor to liquidated damages for each calendar day by which such completion is delayed beyond the applicable Date for Completion. For purposes of liquidated damages, the concept of substantial completion shall not constitute completion and is not part of the Contract Documents. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer if the Project were not completed by the applicable Date for Completion are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages that the Owner would suffer if completion is delayed include, but are not limited to, loss of the use of the Project, disruption of activities, costs of administration, supervision and the incalculable inconvenience and loss suffered by the public.

**.1 Step One Liquidated Damages:** Accordingly, the Parties agree that the following dollar figure shall be the amount of damages which the Owner shall directly incur upon failure of the Contractor to complete the Project, or applicable parts thereof, within the time specified, $1,000.00 for each calendar day by which completion of the Project, or applicable parts thereof, is delayed beyond the Date for Completion as adjusted by change orders. If the Contractor becomes liable under this Section, the Owner, in addition to all other remedies provided by law, shall have the right to withhold all retained percentages of payments and/or progress payments, and to collect the interest thereon, which would otherwise be or become due the Contractor until the liability of the Contractor under this Article has been finally determined. If the retained percentages and withheld progress payments are not sufficient to discharge all liabilities of the Contractor incurred under this Section, then the Contractor and its sureties shall continue to remain liable to the Owner for such liabilities until all such liabilities are satisfied in full. If the Owner accepts any work or makes any payment under this Agreement after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any Agreement provisions regarding time of completion and liquidated damages.

**.2 Step Two Liquidated Damages:** Failure to close out the Project, or applicable phases of the Project, shall subject the Contractor to Step Two Liquidated Damages for each calendar day by which such completion is delayed beyond 65 days of the Notice of Completion. Damages that the Owner would suffer if project close out is delayed include, but are not limited to, disruption of activities, costs of administration, supervision and

professional fees. Accordingly, the Parties agree that the following dollar figure shall be the amount of damages which the Owner shall directly incur upon failure of the Contractor to complete the Project, or applicable parts thereof, within the time specified, $250.00 for each calendar day by which completion of the Project, or applicable parts thereof, is delayed beyond the Date for Notice of Completion. If the Contractor becomes liable under this Section, the Owner, in addition to all other remedies provided by law, shall have the right to withhold all retained percentages of payments and/or progress payments, and to collect the interest thereon, which would otherwise be or become due the Contractor until the liability of the Contractor under this Article has been finally determined.

**6.4 Denial of Right to Bid:** Contractors or subcontractors who have violated state law governing public works shall be denied the right to bid on this public work contract as set forth in California Labor Code Section 1777.7. In accordance with Public Contract Code Section 6109, with respect to subcontractors which are ineligible to perform work on public works projects pursuant to Labor Code Section 17771.1 or 1777.7:

**.1** The Contractor shall not allow any such subcontractor to work on this project.

**.2** The Contractor shall repay to the Owner any money paid to any such subcontractor allowed to work on this project.

**.3** The Contractor shall pay the wages of the workers of any such subcontractor allowed to work on this project.

**6.5 DIR Registration:** The Contractor and any proposed subcontractors shall not be qualified to submit a bid or to be listed in a bid proposal for the Project unless currently registered and qualified under Labor Code section 1725.5 to perform public work as defined by Division 2, Part 7, Chapter 1 (§§1720 et seq.) of the Labor Code.

**6.6 Pre-qualification of Contractor and Certain Subcontractors:** Owner has determined that the Project is subject to the requirements of Public Contract Code section 20111.6. Accordingly, the Owner has required that Contractor and all electrical, mechanical, and plumbing subcontractors to be utilized on the Project complete and submit to the Owner a standardized pre-qualification questionnaire and financial statement. The questionnaire and financial statement has been verified under oath by the pre-qualification applicants in the manner in which civil pleadings in civil actions are verified. The questionnaires and financial statements are not public records and are not open to public inspection.

The Owner has adopted and applied a uniform system of rating the pre-qualification applicants on the basis of the completed questionnaires and financial statements. The questionnaire and financial statement, and the uniform system of rating applicants cover, at a minimum, the issues covered by the standardized questionnaire and model guidelines for rating bidders developed by the DIR pursuant to Public Contract Code section 20101(a).

If the Project includes electrical, mechanical, or plumbing components that will be performed by electrical, mechanical, or plumbing contractors, then a list of pre-qualified general contractors and electrical, mechanical, and plumbing subcontractors has been or will be made available by the Owner to all bidders at least five business days prior to the dates fixed for the receiving and opening of bids on the Project.

A bid will not be accepted from any person or other entity that is required to submit a completed questionnaire and financial statement for pre-qualification or from any person or other entity that uses a subcontractor that is required to submit a completed questionnaire and financial statement for pre-qualification, but has not done so at least 10 business days prior to the date fixed for the receiving and opening of bids on the Project or has not been pre-qualified for at least five business days prior to that date.

For purposes of this Article, electrical, mechanical, and plumbing subcontractors are contractors licensed pursuant to Section 7058 of the California Business and Professions Code, specifically contractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and C-46 licenses, pursuant to regulations of the Contractors' State License Board.

**END OF SECTION 00 2110**

MANGINI

**MANGINI ASSOCIATES INC.**
4320 West Mineral King Avenue
Visalia, California 93291
(559) 627-0530

**www.mangini.us**

# PRE-BID REQUEST FOR INFORMATION

**TO:** Mangini Associates Inc.
**Attn:**

**DATE:**
**CONTRACTOR'S RFI NO.:**
**ARCHITECT'S RFI NO.:**
**PROJECT NO.:**
**DSA APPL. NO.:**

**PROJECT:**

**Subject:**
**Plan/Spec. Ref:**
**Question:**

**Suggestion:**

**Attachments:**

**By:** **Company:** **Title:**
**Phone:** **Fax:** **Email:**

**Response:**

☐ Included in Addendum No.:
☐ Not Included in Future Addendum

**By:** **Title:**
**MANGINI ASSOCIATES INC.**

**CC:**

**SECTION 00 2410 - SCOPES OF BIDS**

**1.** **GENERAL:** This Section is intended as clarification of the bids required in Section 00 4110 - Bid Form. Should bidders not understand the requirements of the bid, it is their responsibility to contact the Architect within seven calendar days prior to the bid opening to obtain a clarification of such items. The address and telephone numbers of the Architect and each of the Consultants are on the cover sheet for your convenience.

**2.** **BIDS REQUIRED:** Bids for this project shall include all labor, materials, tax, freight, permits, fees, etc., required to complete the project as specified and indicated in the Drawings and Specifications, including the General and Supplemental Conditions to the Contract.

**A.** **BASE BID WORK:** All work required to satisfactorily complete the work indicated in the Drawings and Project Manual approved by the Division of the State Architect, excluding the Alternate Bids.

**END OF SECTION 00 2410**

**SECTION 00 3100 - AVAILABLE PROJECT INFORMATION**

**PART 1 - GENERAL**

1.1 SUMMARY

A. This Section describes information available to the bidders and the use of such information.

1.2 OWNER'S RECORD DRAWINGS

A. The Owner is in possession of record drawings of existing site improvements and buildings. These drawings may be inspected at the office of the Owner.

B. Use of Owner's Record Drawings:
1. These drawings, along with visual observations, were used for the Architect's guidance in the design of this Project, and are not a contract document.
2. These drawings are available to bidders, for information only, so that bidders have full disclosure of all information available to the Owner and Architect with respect to existing improvements at the Site. These drawings are not a warranty of subsurface or hidden conditions.
3. Bidders should visit the site and acquaint themselves with existing conditions.
4. Prior to bidding, bidders may make their own investigations to satisfy themselves as to existing conditions, but such investigations may be performed only under time schedules and arrangements approved in advance by the Architect and the Owner.

C. Cautions to Contractor: These drawings represent only those conditions existing at the time the drawings were prepared and may not reflect changes or construction subsequent to preparation of the drawings.

1.3 HAZARDOUS MATERIALS REPORTS

A. A. A survey of the existing buildings for asbestos containing material was conducted between July 16, 2025 – July 18, 2025, and the resulting report prepared by Forensic Analytical Consulting Services dated July 19, 2025 is attached to this Section.
1. Removal of asbestos containing material is specified in Section 02 2620 – Hazardous Material Abatement.

B. A survey of the existing buildings for lead based paint was conducted between July 16, 2025 – July 18, 2025, and the resulting report prepared by Forensic Analytical Consulting Services dated July 19, 2025 is attached to this Section.
1. Decontamination of lead based paint is specified in Section 02 2620 – Hazardous Material Abatement.

**END OF SECTION 00 3100**

FACS
Forensic Analytical Consulting Services

July 30, 2025

# Hazardous Building Materials Survey Report

**Modernization Survey**
**Monroe Elementary School**
**300 Monroe Drive**
**Hanford, CA 93230**

Prepared for:

**Daniel Pierotte, Director**
**Facilities and Operations**
**Hanford Elementary School District**
714 North White Street
Hanford, CA 93230
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Prepared By:

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FACS Project #PJ87201

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**Appendix B: Lead Paint Chip Summary, Sample Chain-of-Custody, Laboratory Results Report, XRF Testing Data and CDPH 8552 Form**

**Appendix C: Site Photos and Sample Location Drawings**

**Appendix D: Certifications of Personnel and Laboratories**

## List of Acronyms

| | |
|---|---|
| AAS | Atomic Absorption Spectroscopy |
| ACBM | Asbestos-Containing Building Material |
| ACCM | Asbestos-Containing Construction Material |
| ACM | Asbestos-Containing Material |
| AHERA | Asbestos Hazard Emergency Response Act |
| AIHA | American Industrial Hygiene Association |
| CAC | California - Certified Asbestos Consultant |
| Cal/OSHA | California Occupational Safety and Health Association |
| CCR | Code of California Regulations |
| CFR | Code of Federal Regulation |
| CSST | California – Certified Site Surveillance Technician |
| DOSH | Department of Occupational Safety and Health |
| ELAP | Environmental Laboratory Accreditation Program |
| EPA | Environmental Protection Agency (EPA) |
| FACS | Forensic Analytical Consulting Services, Inc. |
| ICP | Inductively Coupled Plasma |
| LCP | Lead-Containing Paint |
| LBP | Lead-Based Paint |
| ND | None Detected |
| NESHAP | National Emissions Standard Hazardous Air Pollutants |
| NIOSH | National Institute for Occupational Safety and Health |
| NIST | National Institute of Science and Technology |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| PCM | Phase Contrast Microscopy |
| PLM | Polarized Light Microscopy |
| SGS | SGS - Forensic Laboratories |
| TEM | Transmission Electron Microscopy |
| TTLC | Total Threshold Limit Concentration |
| XRF | X-Ray Fluorescence Spectrum Analyzer |
| < | Less Than Reporting Limit |

## Executive Summary

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Hanford Elementary School District to perform an asbestos and lead paint survey in multiple classroom wings of Monroe Elementary School, located at 300 Monroe Drive in Hanford, California. The survey included any suspect asbestos-containing materials (ACM) and suspect lead-containing paints and coatings which may be disturbed during the planned modernization project. A summary list of suspect asbestos-containing materials which were identified and sampled is included in Appendix A of this report. A table reporting suspect lead-containing paints or coatings which were identified and sampled is included in Appendix B of this report. The survey was performed from July 16 through July 18, 2025.

**Asbestos**

The following suspect materials were sampled during this survey and identified to **contain** asbestos by laboratory analysis:

- Canvas Wallpaper over Plaster (Trace – Chrysotile – handle as more than 1%)
- Drywall – Stipple Texture (Trace - Chrysotile – handle as more than 1%)
- 12” VFT and Mastic – White Oatmeal (Trace – Chrysotile – handle as more than 1%)
- 6” Baseboard and Mastic – Grey (2% - Chrysotile)
- Black Mastic Pucks (7% - Chrysotile)
- Drywall – Tape and Joint Compound Only (2% - Chrysotile)
- VSF and Mastic – White with Blue Specks (2% - Chrysotile)
- Linoleum and Mastic – Mauve with Blue Specks (2% - Chrysotile)
- White Window Patch Sealant (Trace – Chrysotile – handle as more than 1%)
- Window Putty (2% - Chrysotile)
- Grey Penetration Mastic (3% - Chrysotile)
- Vinyl Baseboard Tile and Mastic (2% - Chrysotile)
- Door/Window Frame System Sealant (Trace – Chrysotile – handle as more than 1%)
- Door Frame Sealant (Trace – Chrysotile – handle as more than 1%)
- Light Grey Window Patch Putty (2% - Chrysotile)
- Thin White Window Putty (Trace - Chrysotile – handle as more than 1%)
- Textured Wood Siding (2% - Chrysotile)
- Storefront System Sealant – Portables (2% - Chrysotile)
- Textured Siding Sealant (2% - Chrysotile)
- Storefront System Window Putty (3% - Chrysotile)

Please see Appendix A for a complete listing of materials sampled at the work areas and results from this survey. Any suspect materials not included must be assumed to be asbestos-containing materials until tested and proven not to contain asbestos.

**Lead**

The following paints/coatings did not contain detectable concentrations of lead above the laboratory’s reporting limit:

- White Paint on Wood Window Trims – Interior Portable Classrooms
- Green Paint on Metal Door Frames - Buildings A and A1 Main Entry Doorways
- Green Paint on Metal Doors – Main Entry Doors
- Grey Paint on Stucco Wall – Permanent Buildings
- Grey Ramp Coating – Portable Buildings

- Green/Brown Paint on Metal Door – Portable Buildings
- Grey Paint on Wood Siding – Portable Buildings
- Green Paint on Metal Flashing – Portable Buildings
- Grey Paint on Metal Framing – Portable Buildings
- Green Paint on Wood Trim – Portable Buildings

The following paints were found to be **lead-based** by XRF analysis:

- Green Paint on Wood Window Trim – Permanent Building
- Beige Wood Cabinets – Buildings A, A1
- Beige Metal Support Pole – Permanent Buildings Walkways
- White Paint on Wood Walls – Building A
- White Porcelain Sinks – Buildings A, A1, B
- Green Paint on Wood Windowsills – Permanent Building
- Tan Paint on Wood Wall (Canvas Wallpaper) – Building A1
- Beige Paint on Wood Windowsill – Building A1
- Grey Ceramic Wall Tiles – Restrooms
- Light Grey Ceramic Wall Tiles – Restrooms
- Grey Paint on Metal Extinguisher Box – Building C
- White Paint on Wood Window Trim – Building E

All other paints contained detectable concentrations of lead by XRF analysis or laboratory analysis. Any paints not included in the survey, or paints with results of 0.00 mg/cm² by XRF analysis without confirming representative laboratory result, must be handled as lead-containing unless sampled and proven otherwise.

FACS recommends that the results of this report be incorporated into any modernization plans provided for this project for informational purposes.

## Introduction

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Hanford Elementary School District to perform an asbestos and lead paint survey in multiple classroom wings of Monroe Elementary School, located at 300 Monroe Drive in Hanford, California. The survey included any suspect asbestos-containing materials (ACM) and suspect lead-containing paints and coatings which may be disturbed during the planned Modernization project. The survey was performed from July 16 through July 18, 2025.

## Scope of Work

The purpose of this survey was to identify asbestos-containing materials (ACMs) and lead-containing paints and coatings which may be disturbed during the upcoming modernization project. The visual inspection, bulk sampling, and survey documentation were performed by Ethan McLaughlin and Chris Chipponeri. Ethan McLaughlin is a US EPA Accredited AHERA Building Inspector and a California Department of Public Health (CDPH) Certified Lead Sampling Technician (LRC-00014177). Chris Chipponeri is a Division of Occupational Safety and Health (DOSH) Certified Asbestos Consultant (CAC #10-4633), US EPA Accredited AHERA Building Inspector and CDPH Certified Lead Inspector/Assessor (LRC-00000782), as required under California regulations. The scope of the survey and the services provided by FACS included:

- Performing a visual inspection of the project area to identify accessible suspect asbestos-containing materials (ACMs) and lead-containing paints and coatings that will be disturbed during the planned project;
- Collection of bulk material samples for asbestos laboratory analysis by polarized light microscopy (PLM);
- Performance of a lead paint survey using a SciAps x-ray fluorescence (XRF) spectrum analyzer;
- Collection of bulk paint chip samples for lead laboratory analysis using atomic absorption spectrometry (AAS);
- Ensuring the technical quality of all work by using Asbestos Hazard Emergency Response Act (AHERA) accredited Building Inspectors;
- Ensuring the technical quality of all work by using California Department of Public Health (CDPH) Certified Lead Sampling Technicians and Inspector/Assessors; and
- Consolidating data and findings into a report format.

## Site Characterization

The classroom wings were comprised of common construction materials such as vinyl floor tile and carpet floor finishes, false ceiling panels and acoustic ceiling tiles at ceiling areas, and drywall and plaster walls and ceilings. The school’s primary colors are grey and green on various substrates and components.

# Survey Methods

### Document Review

No previous documentation was reviewed prior to the inspection. The extent of the planned modernization project was provided via architectural drawings from Mangini Associates, Inc. and Hanford Elementary School District.

### Visual Inspection

Accessible building materials were visually inspected using the methods presented in the Federal AHERA regulations (40 CFR, Part 763). AHERA inspection methodology is required to be used for inspections of K-12 schools and is generally accepted as the industry standard for all ACM inspections regardless of structure or facility type. Suspect ACMs were also physically assessed for friability, condition and possible disturbance factors.

All areas were accessible during this inspection.

### Asbestos Inspection

Bulk Sample Collection

Bulk samples of identified homogeneous materials were collected in building areas that may be impacted by the planned renovation/demolition activities. Samples were collected of each separate homogeneous area. A homogeneous area is defined as a surfacing material, thermal system insulation, or miscellaneous material that is uniform in use, color and texture. Examples of homogeneous areas could include:

Vinyl floor tiles
False ceiling panels
Drywall with joint compound
Vinyl sheet flooring

The specific number of samples collected was determined by using the methods required by the Federal AHERA regulations (40 CFR, Part 763.86) as noted below:

1) For Surfacing Material:
   1,000 $ft^2$ or less - collect 3 samples
   1,001 to 5,000 $ft^2$ - collect 5 samples
   5,001 $ft^2$ or greater - collect 7 samples

2) For Thermal System Insulation:
   “In a randomly distributed manner” - collect 3 samples
   6 linear feet of patching or less - collect 1 sample
   cementitious pipe fittings - “In a manner sufficient to determine”

3) For all Miscellaneous Material:
   Collect samples "In a manner sufficient to determine whether material is ACM (asbestos-containing material) or not ACM..."

The suspect ACMs were sampled using a knife, chisel, scraper, drill or other similar coring device suitable to the type of material sampled to cut through its entire thickness and to ensure that a cross-section of the material was obtained. The material was then placed in an appropriately labeled container

that was sealed and submitted to SGS-Forensic Laboratories for analysis. A unique sample number (e.g. PJ87201-01A) was assigned to each sample.

Bulk samples will be retained by the laboratory for one month unless otherwise instructed. After this period, the samples will be disposed of appropriately.

Bulk Sample Analysis

A total of one hundred seventy (170) bulk samples were collected from a total of ninety-four (94) suspect materials. Bulk samples were analyzed by SGS-Forensic Laboratories (SGS) in Hayward, California. SGS is accredited by the California Department of Public Health (CDPH) Environmental Laboratory Accreditation Program (ELAP) and the National Institute of Science and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP). SGS participates in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing Program and has substantial experience in the analysis of asbestos.

All samples were analyzed using Polarized Light Microscopy with Dispersion Staining (PLM/DS) techniques in accordance with the methodology approved by the U.S. Environmental Protection Agency (EPA). The percentage of asbestos present in the samples was determined on the basis of a visual area estimation. The EPA defines asbestos-containing materials (ACM) as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM). 40 CFR Part 763 identifies the lower limit of reliable quantification for asbestos using the PLM method as approximately one percent (1%) by volume. Regulations in California (CAL/OSHA Title 8 CCR 1529) define asbestos-containing construction materials (ACCM) as those materials having asbestos content of greater than one tenth of one percent (> 0.1%); therefore, for the purpose of this survey, any amount of asbestos detected will be considered positive. In addition to the percentages, the types of asbestos minerals are also reported. The PLM method is the standard method used to analyze asbestos bulk samples.

When "None Detected" (ND) appears in the laboratory results, it should be interpreted as meaning asbestos was not observed in the sample material.

**Lead Inspection**

The client-defined lead inspection was conducted in accordance with the CDPH Lead-Related Construction Program and modeled upon the sampling protocol described in “Chapter 7: Lead Based Paint Inspection” of the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1997 Revision).

Cal/OSHA, in Title 8 California Code of Regulations (CCR) Section 1532.1, Lead in Construction Standard which implements California Labor Code 8716-6717, regulates all construction work where an employee may be occupationally exposed to lead. Paint or materials with any detectable level of lead is considered lead-containing by Cal/OSHA.

XRF Testing Methodology

Surfaces and components were surveyed for lead content utilizing a portable X-ray fluorescence (XRF) analyzer, SciAps X-550Pb, serial number 01149. The XRF analyzer contains a battery powered x-ray cathode source which bombards tested surfaces with X-rays and gamma rays. This external energy source excites any lead atoms within the tested paint or coating, causing their atoms to emit X-ray photons with a characteristic energy profile. The instrument analyzes the emitted energy to identify and quantify the amount of lead in the tested paint or coating, with lead content reported in milligrams per square centimeter.

Testing combinations of homogeneous components in one area are representative of similar components found in other areas with similar construction and painting histories. During this survey, the inspector visually identified the painted or coated component to test, an XRF reading was collected, and the reading was documented in the XRF data table contained in Appendix B. For each test reading, the data table identifies the room equivalent/space designation, the tested component name, the substrate material, the sample location, paint/coating color, condition assessment, and the XRF result expressed as lead content by weight in milligrams per square centimeter ($mg/cm^2$).

Bulk Sampling Methodology

During this inspection, FACS personnel collected thirteen (13) bulk paint chip samples for laboratory confirmation of lead-content. Each sample was scraped from the substrate it had been applied to using a knife or chisel to obtain sufficient material for analysis. Each sample was given a unique marker number, identified on a chain-of-custody, packaged, and sent via FedEx to SGS in Hayward, California for analysis. SGS is accredited by the American Industrial Hygiene Association's Environmental Lead Laboratory Accreditation Program for the analysis of lead in bulk paint chips by flame atomic absorption.

## Regulations

### Background

Asbestos is the name of a class of magnesium-silicate minerals that occur in fibrous form. Minerals that are included in this group are chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos. Although the chrysotile minerals are the most common type of asbestos found in the construction industry, all types of asbestos are regulated in the same manner. Asbestos has been used in more than 3,000 different building materials. Asbestos was added to building materials to: increase fire-resistance, insulate against heat, cold and sound, resist corrosion, and increase tensile strength. Common building materials that may contain asbestos include but are not limited to the following: floor tile, resilient sheet flooring, ceiling tile, mastics, roofing materials, fireproofing, acoustical treatments, wallboard, pipe and boiler insulations. Adverse health effects have been associated with the inhalation of airborne asbestos. However, asbestos fibers that are tightly bound in the building material, may not represent an exposure hazard, unless disturbed in such a way that releases airborne fibers (i.e., cutting, drilling, sanding, and other abrasive methods).

### Building Surveys

The following is a summary of some current Federal and California State regulations which contain requirements related to the performance of building surveys for asbestos. These summaries are not intended to be all inclusive and do not contain every aspect of the regulations discussed.

U.S. EPA National Emission Standard for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61

Under the NESHAPs regulation, no visible emissions are allowed during building demolition or renovation activities which involve regulated asbestos-containing materials. For this reason, all buildings must be surveyed for asbestos-containing materials prior to demolition or renovation. The EPA, CARB, and/or the local Air Quality Management District which implements EPA actions, must be notified prior to any building demolition even if no asbestos-containing materials are present. Regulated asbestos-containing material (RACM) is defined as a) any friable material with an asbestos content of greater than one percent, or b) any non-friable material with asbestos content of greater than one percent that will, or could, become friable.

Asbestos Hazard Emergency Response Act (AHERA), 40 CFR Part 763, Subpart E

AHERA requires performance of asbestos surveys and the development of Asbestos Management Plans for all primary and secondary schools in the United States. Although this regulation applies to primary and secondary schools only, the procedures mandated under AHERA are considered the industry standard and are applied to all surveys performed by FACS unless otherwise specified by the building owner.

**Worker Protection**

California Assembly Bill AB3713, Health and Safety Code Division 20, Chapter 10.4, Section 25915-25924

The state of California has enacted legislation that requires building owners, employers, lessees, etc. to notify tenants, employees and contractors of the presence of asbestos in both friable and non-friable forms. In addition, preventive maintenance activities must be developed and communicated to these parties. Notification is required 15 days after the identification of ACM in the building, and annually thereafter.

Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101 and 8 CCR 1529

The Federal and State Occupational Safety and Health Administrations (OSHA) require employers to implement specific work practices which protect workers from airborne asbestos exposure.

Building materials which contain even low levels of asbestos (<1%) can potentially generate significant concentrations of airborne asbestos fibers when disturbed. Therefore, control measures should be instituted which adequately address worker health and safety during planned renovation or demolition activities involving these materials. Cal/OSHA defines asbestos-containing construction materials as those materials having greater than one tenth of one percent asbestos (>0.1%). As stated previously, there is currently no viable method to accurately quantify asbestos at this level.

**Hazardous Waste**

Building materials reported to contain less than one percent (<1%) of asbestos are not considered hazardous by the U.S. EPA, and hence, may not require removal and disposal prior to demolition or renovation. Regulations may vary, however, between regional air quality management districts and/or other state agencies responsible for implementing EPA's rules. Therefore, local agencies should be contacted for specific ACM definitions and handling requirements. Cal/OSHA may also require special packaging and labeling on containers with asbestos-containing construction materials.

Composite sampling, which may potentially reduce the total asbestos content of the material, is only permitted when sampling joint compound, tape, and gypsum wallboard according to EPA’s Asbestos NESHAP Clarification Regarding Analysis of Multi-Layered Systems (40 CFR Part 61 FRL-4821-7).

**Lead**

Cal/OSHA Lead (8 CCR 1532.1) & CDPH (Title 17)

If paints or coatings containing any detectable concentration of lead will be impacted, a project should be considered regulated by Cal/OSHA as lead-related construction (8 CCR 1532.1).

A contractor who has employees that may be occupationally exposed to lead during a project must perform an initial determination regarding worker exposures to lead, which may be based on personal air

monitoring at the start of the project or prior employee monitoring from the past 12 months under workplace conditions closely resembling the current project, that demonstrates exposures will not exceed the Cal/OSHA action level (2 micrograms per cubic meter of air). It is the contractor's responsibility to conduct their initial determination and comply with any relevant Cal/OSHA requirements.

Workers disturbing existing paints or coatings during a project must have lead awareness or action level training, depending on the initial exposure determination. Workers that will disturb paints with detectable concentrations of lead must use lead-safe work practices regardless of results of any exposure monitoring data. Disturbance of lead-containing paints or coatings must be performed within a contained area to prevent the spread and build-up of lead dust in order to comply with CDPH requirements. HEPA vacuums, dustless tools or shrouds, and/or intact removal of components should be employed to minimize lead dust generation and properly cleanup work areas following disturbance to lead-containing materials during a project. Waste generated during disturbance to lead-containing materials must be profiled in a hazardous waste determination to ascertain proper disposal requirements.

If the initial determination or initial exposure monitoring shows that workers impacting lead can be expected to be, or are shown to be, exposed to lead above 50 micrograms per cubic meter of air, workers and supervisors must have the requisite training and CDPH lead worker or supervisor certification.

The Cal/OSHA regulation was recently revised and additional requirements must be met by employers with employees that disturb lead paint. Any contractor / employer that may require workers to disturb lead-containing paints found with the project area should ensure that they are familiar and in compliance with the new revisions to the regulation.

EPA Renovation, Repair and Painting Rule Requirements

The EPA's Renovation, Repair, and Painting (RRP) rule applies to disturbance of lead-based paints at child-occupied facilities constructed before 1978. In the context of the RRP rule, child-occupied facility is defined as being visited by the same child under the age of 6 on two or more days per week for at least 3 hours per visit with a cumulative annual total of 60 hours.

If more than 6 square feet of painted or coated components with lead-based paint is to be disturbed during this project at interior areas, or 20 square feet or more at exterior areas, the work (and this project) would be regulated under the RRP rule. In addition, the RRP rule is triggered if windows have "wet-applied" lead-based paint and one window will be removed.

Firms paid to perform RRP-covered work must be registered with the US EPA RRP program; this requirement applies to a General Contractor, Construction Management firm, or other entity contracting for and overseeing the work, even if the actual RRP-covered work is performed by a sub-contractor or other firm. Firms may not bid on an RRP-covered project without first obtaining firm certification, and contracts for RRP-covered projects may not be awarded to firms without firm certification. Proof of RRP firm certification must be submitted to the Owner.

The RRP rule requires distribution of the EPA's *Renovate Right* lead hazard information pamphlet before the start of covered work to occupants, building owners, and parents of children in child-occupied facilities. This may be fulfilled by distributing individual copies of the pamphlet, or publicly posting the pamphlet at accessible locations at the project site. The contractor must document how they have fulfilled this requirement and must submit this proof to the Owner.

In addition to any Cal/OSHA or CDPH required training for all lead workers, at least one such supervisory employee working on the project must have received EPA-approved RRP training and possess a valid Certified Renovator certification. The Certified Renovator may be provided by the firm directly

performing the work covered by the RRP rule or by the controlling firm if the work is sub-contracted; in such cases, both firms are not required to provide a Certified Renovator. Other workers disturbing lead during an RRP project may receive on-the-job training from a Certified Renovator on the RRP Rule and its requirements or may themselves be Certified Renovators. Proof of Certified Renovator certification and training of other workers must be submitted to the Owner

The RRP rule also requires the use of lead-safe work practices. Work area containment must be used, which is fulfilled by using drop sheets, and vertical barriers if needed, to prevent dust and debris from leaving the work area. Wet-work methods should be used to minimize airborne lead dust generation. Open-flame burning, use of heat guns at greater than 1,100 degrees Fahrenheit, and use of power tools without HEPA exhaust controls are prohibited work practices under the RRP rule. High-pressure power washing of surfaces that dislodges paint would require capture and filtering of all water; this method should be avoided to limit the potential for creating a lead-hazard during the project. Following the lead disturbance, surfaces must be thoroughly cleaned to remove all dust and debris, and the contractor must perform and document their cleaning verification wipe sampling if performing work at interior locations.

Additional requirements exist within the rule. It is recommended that Hanford Elementary School District ensure contractors disturbing paints are thoroughly familiar with the requirements of the rule.

## Findings and Recommendations

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Hanford Elementary School District to perform an asbestos and lead paint survey in various wings of Monroe Elementary School, located at 300 Monroe Drive in Hanford, California.

**Asbestos**

The following suspect materials were sampled during this survey and identified to **contain** asbestos by laboratory analysis:

- Canvas Wallpaper over Plaster (Trace – Chrysotile – handle as more than 1%)
- Drywall – Stipple Texture (Trace - Chrysotile – handle as more than 1%)
- 12” VFT and Mastic – White Oatmeal (Trace – Chrysotile – handle as more than 1%)
- 6” Baseboard and Mastic – Grey (2% - Chrysotile)
- Black Mastic Pucks (7% - Chrysotile)
- Drywall – Tape and Joint Compound Only (2% - Chrysotile)
- VSF and Mastic – White with Blue Specks (2% - Chrysotile)
- Linoleum and Mastic – Mauve with Blue Specks (2% - Chrysotile)
- White Window Patch Sealant (Trace – Chrysotile – handle as more than 1%)
- Window Putty (2% - Chrysotile)
- Grey Penetration Mastic (3% - Chrysotile)
- Vinyl Baseboard Tile and Mastic (2% - Chrysotile)
- Door/Window Frame System Sealant (Trace – Chrysotile – handle as more than 1%)
- Door Frame Sealant (Trace – Chrysotile – handle as more than 1%)
- Light Grey Window Patch Putty (2% - Chrysotile)
- Thin White Window Putty (Trace - Chrysotile – handle as more than 1%)
- Textured Wood Siding (2% - Chrysotile)
- Storefront System Sealant – Portables (2% - Chrysotile)
- Textured Siding Sealant (2% - Chrysotile)
- Storefront System Window Putty (3% - Chrysotile)

Please see Appendix A for a complete listing of materials sampled at the work areas and results during this survey. Any suspect materials not included must be assumed to be asbestos-containing materials until tested and proven not to contain asbestos.

Removal of more than 100 square feet of asbestos-containing materials must be completed by a contractor registered with DOSH as an asbestos abatement contractor. The contractor must also hold the C-22 asbestos abatement license from the CSLB to perform abatement of more than 100 square feet of asbestos-containing materials.

Workers abating asbestos-containing materials must have AHERA Worker training and one worker shall be trained to the AHERA Contractor-Supervisor level. Workers will need to use containment, work practices, and engineering controls as required by Cal/OSHA for the various classes of work that may be required to be performed. The contractor performing abatement must also file a “report of use” temporary worksite notification to the local Cal/OSHA office at least 24 hours prior to mobilizing to the site.

The US EPA NESHAP regulation requires the abatement of asbestos-containing materials that are friable or likely to become friable by forces impacting them as part of any renovation activities. If more than 160 square feet of RACM will be generated by the project, a 10-working day notification must be filed with the San Joaquin Valley Air Pollution Control District prior to work commencing onsite. Those materials that are friable, or non-friable materials made friable during removal, would need to be disposed of as hazardous (regulated) asbestos-containing material. Non-friable materials that are not made friable may be disposed of as non-hazardous asbestos-containing waste material at a landfill that will accept the waste.

See the Regulations section above for additional information regarding asbestos compliance.

**Lead**

The following paints/coatings did not contain detectable concentrations of lead above the laboratory’s reporting limit:

- White Paint on Wood Window Trims – Interior Portable Classrooms
- Green Paint on Metal Door Frames - Buildings A and A1 Main Entry Doorways
- Green Paint on Metal Doors – Main Entry Doors
- Grey Paint on Stucco Wall – Permanent Buildings
- Grey Ramp Coating – Portable Buildings
- Green/Brown Paint on Metal Door – Portable Buildings
- Grey Paint on Wood Siding – Portable Buildings
- Green Paint on Metal Flashing – Portable Buildings
- Grey Paint on Metal Framing – Portable Buildings
- Green Paint on Wood Trim – Portable Buildings

The following paints were found to be **lead-based** by XRF analysis:

- Green Paint on Wood Window Trim – Permanent Building
- Beige Wood Cabinets – Buildings A, A1
- Beige Metal Support Pole – Permanent Buildings Walkways
- White Paint on Wood Walls – Building A
- White Porcelain Sinks – Buildings A, A1, B
- Green Paint on Wood Windowsills – Permanent Building
- Tan Paint on Wood Wall (Canvas Wallpaper) – Building A1
- Beige Paint on Wood Windowsill – Building A1

- Grey Ceramic Wall Tiles – Restrooms
- Light Grey Ceramic Wall Tiles – Restrooms
- Grey Paint on Metal Extinguisher Box – Building C
- White Paint on Wood Window Trim – Building E

All other paints contained detectable concentrations of lead by XRF analysis or laboratory analysis. Any paints not included in the survey, or paints with results of 0.00 mg/cm² by XRF analysis without confirming representative laboratory result, must be handled as lead-containing unless sampled and proven otherwise.

Workers that impact paints containing any detectable amount of lead must use lead-safe practices and have valid training for the method of impact to comply with Cal/OSHA, 8 CCR 1532.1. To comply with CDPH requirements, any disturbance to paints or coatings that contain lead must be completed within a contained area to prevent the creation of a lead hazard. To comply with California Department of Toxic Substance Control and Title 22 requirements, any waste streams containing lead must be profiled prior to disposal.

See the Regulations section above for additional information regarding lead compliance.

FACS recommends that the results of this report be incorporated into any modernization plans provided for this project for informational purposes.

## Limitations

This investigation is limited to the conditions and practices observed, and information made available to FACS. The methods, conclusions and recommendations provided are based on FACS' judgment, expertise, and the standard of practice for professional service. They are subject to the limitations and variability inherent in the methodology employed. As with all environmental investigations, this investigation is limited to the defined scope and does not purport to set forth all hazards, nor indicate that other hazards do not exist.

Please do not hesitate to contact our office at (559) 436-0277 with any questions or concerns. Thank you for the opportunity to assist Hanford Elementary School District with promoting worker safety and a healthy environment.

Respectfully,
FORENSIC ANALYTICAL

Ethan McLaughlin

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CDPH LRC-00014177

Reviewed by:
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# Appendix A

## Asbestos Function Space Notes, Sample Chain-of-Custody and Laboratory Results Report

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District

**Site:** James Monroe Elementary School

**FACS Project Number:** PJ87201

**Date of Inspection:** July 15, 2025

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 01 - Building A | | **Room:** | **01 - Room 10 Office - 11 x 20 x 11** | | | | | |
| **Floor:** | Carpet & Mastic - Black Walk Off | SURF | None Detected | 1 | 1A | 12 | sq | |
| **Floor:** | Carpet & Mastic - Tan-Blue Multi | MISC | None Detected | 6 | 6A | 208 | sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 62 | ln | |
| **Walls:** | Canvas Wallpaper over Drywall | MISC | None Detected | 7 | 7A, 7B | 341 | sq | |
| **Walls:** | Canvas Wallpaper over Plaster | MISC | 1 % | 3 | 3B | 170 | sq | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 220 | sq | |
| | *Comment: Visible at edge of FCP system and extends above the FCP system. Material Comment: Material is nailed onto wood slats.* | | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 220 | sq | |
| *Room Comments:* | *Located on the east side of the building.* | | | | | | | |
| **Building:** 01 - Building A | | **Room:** | **02 - Storage Room - 11 x 11 x 14** | | | | | |
| **Floor:** | Carpet & Mastic - Black Walk Off | SURF | None Detected | 1 | | 12 | sq | |
| **Floor:** | Carpet & Mastic - Tan-Blue Multi | MISC | None Detected | 6 | | 109 | sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 44 | ln | |
| **Walls:** | Drywall - Stipple Texture | MISC | 1 % | 8 | 8A | 308 | sq | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 121 | sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | | |
| *Room Comments:* | *Sloped ceiling from ~17' to 11' in height.* | | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
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| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 01 - Building A | **Room:** 03 - Classroom 11 - 42 x 30 x 11 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | 11A | 1194 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | 9A | 66 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 144 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 792 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Drywall - Stipple Texture | MISC | 1 % | 8 | 8B | 158 sq | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | 5A | 1260 sq | |
| | *Comment: Material visible at edge of FCP system and extends above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 1260 sq | |
| **Building:** 01 - Building A | **Room:** 04 - Classroom 11 Restrooms - 11 x 10 x 14 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 110 sq | |
| **Baseboard:** | 6" Baseboard and Mastic - Black | MISC | None Detected | 12 | | 42 ln | |
| **Walls:** | Drywall - Stipple Texture | MISC | 1 % | 8 | | 220 sq | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 588 sq | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 25 sq | |
| | *Comment: In the boys restroom space.* | | | | | | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 110 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 8 ln | |
| *Room Comments:* | *Sloped ceiling from ~17' to 11' in height. Functional space notes include the hallway and both restrooms (2).* | | | | | | |
| **Building:** 01 - Building A | **Room:** 05 - Classroom 11 Work Room - 10 x 11 x 11 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 110 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 36 ln | |
| **Walls:** | Canvas Wallpaper over Plaster | MISC | 1 % | 3 | 3A | 231 sq | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 110 sq | |

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 01 - Building A | | **Room:** | **06 - Classroom 11 Storage - 9 x 17 x 16** | | | | | |
| **Floor:** | 12" VFT & Mastic - White Oatmeal | MISC | 1 % | 15 | 15A | 153 | sq | No |
| | *Comment: Asbestos in black mastic layer below flooring. Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Baseboard:** | 6" Baseboard & Mastic - Grey | MISC | 2 % | 16 | 16B | 52 | ln | No |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | 13A | 208 | sq | |
| | *Comment: At the west storage area.* | | | | | | | |
| **Walls:** | Plaster - Stipple Finish | SURF | None Detected | 17 | 17A | 832 | sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 30 | sq | |
| | *Comment: At the west storage area.* | | | | | | | |
| **Ceiling:** | Plaster - Stipple Finish | SURF | None Detected | 17 | | 153 | sq | |
| *Room Comments:* | *Sloped ceiling from ~17' to 14' in height. Space includes both storage areas. There is a doorway connecting with Room 12.* | | | | | | | |
| **Building:** 01 - Building A | | **Room:** | **07 - Classroom 12 - 36 x 30 x 10** | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 1014 | sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 66 | sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 132 | ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 660 | sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | | |
| **Walls:** | Pressed Wood Panel | MISC | None Detected | 60 | 60A | 264 | sq | |
| | *Comment: Upper portion of walls.* | | | | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 1080 | sq | |
| | *Comment: Material visible at edge of FCP system and extends above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 1080 | sq | |
| **Counter:** | Counter Sealant | MISC | None Detected | 18 | 18A | 15 | ln | |
| | *Comment: At sink counter in space.* | | | | | | | |

# Functional Space Notes

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| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 01 - Building A | **Room:** 08 - Classroom 12 Restrooms - 12 x 12 x 10 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 144 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 24 ln | |
| **Baseboard:** | 6" Baseboard and Mastic - Black | MISC | None Detected | 12 | 12A | 24 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 144 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Plaster - Stipple Finish | SURF | None Detected | 17 | | 540 sq | |
| | *Comment: At restroom spaces.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 144 sq | |
| | *Comment: Visible at edges of FCPs and extend above them. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 111 sq | |
| | *Comment: At wash / coat rack area.* | | | | | | |
| **Ceiling:** | Plaster - Stipple Finish | SURF | None Detected | 17 | | 40 sq | |
| | *Comment: At restroom spaces.* | | | | | | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | 14A | 8 ln | |
| *Room Comments:* | *Includes the restrooms (2) and wash/coat rack area.* | | | | | | |
| **Building:** 01 - Building A | **Room:** 09 - Classroom 12 Work Space - 12 x 11 x 10 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 132 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | 2A | 46 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 230 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 132 sq | |
| | *Comment: Visible at edge of FCP system and extends above FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 119 sq | |
| **Counter:** | Counter Sealant | MISC | None Detected | 18 | | 12 ln | |

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 01 - Building A | | **Room:** | **10 - Classroom 12 Storage Closet - 11 x 6 x 15** | | | | | |
| **Floor:** | 12" VFT & Mastic - White Oatmeal | MISC | 1 % | 15 | 15B | 66 | sq | No |
| | *Comment: Asbestos in black mastic layer below flooring. Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Baseboard:** | 6" Baseboard & Mastic - Grey | MISC | 2 % | 16 | 16A | 34 | ln | No |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 510 | sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 66 | sq | |
| *Room Comments:* | *Sloped ceiling from ~17' to 14' in height.* | | | | | | | |
| **Building:** 01 - Building A | | **Room:** | **11 - Exterior - 112 x 30 x 17** | | | | | |
| **Walls:** | Stucco | SURF | None Detected | 58 | 58A | 4828 | sq | |
| **Roofs:** | Comp Shingle Roofing - Grey | MISC | None Detected | 59 | 59A, 59B | 4816 | sq | |
| **Ground:** | Concrete | MISC | None Detected | 23 | | | | |
| **Door:** | Door Frame Sealant - Blds A & A1 | MISC | None Detected | 65 | 65A | 160 | ln | |
| **Roof:** | Grey Penetration Mastic | MISC | 3 % | 63 | 63A | 10 | sq | No |
| **Overhangs:** | Stucco | SURF | None Detected | 58 | | 1456 | sq | |
| **Roof:** | White HVAC Sealant | MISC | None Detected | 64 | 64A | 10 | sq | |
| | *Comment: At penetraions and bolts of platform associated with HVAC units.* | | | | | | | |
| **Windows:** | White Window Patch Sealant | MISC | 1 % | 61 | 61A | 50 | ln | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Windows:** | Window Putty | MISC | 2 % | 62 | 62A | 400 | ln | No |

# Functional Space Notes

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**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 02 - Building A1 | | **Room:** | **01 - Boys Restroom - 14 x 13 x 15** | | | | |
| **Floor:** | 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | 19A | 182 sq | |
| **Baseboard:** | 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 54 ln | |
| | *Comment: Floor tile coved up wall ~6".* | | | | | | |
| **Walls:** | 4" Ceramic Tile and Grout - Grey | MISC | None Detected | 20 | 20A | 405 sq | |
| | *Comment: Waincoting on walls.* | | | | | | |
| **Walls:** | 4" Ceramic Tile and Grout - Light Grey | MISC | None Detected | 22 | 22A | 20 sq | |
| | *Comment: Patches, mostly at sinks.* | | | | | | |
| **Walls:** | Plaster - Smooth Finish | SURF | None Detected | 21 | 21B | 405 sq | |
| **Ceiling:** | Plaster - Smooth Finish | SURF | None Detected | 21 | | 182 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 12 ln | |
| | *Comment: At sinks, toilet and urinals.* | | | | | | |
| *Room Comments:* | *Sloped ceiling from ~17' to 11' in height.* | | | | | | |
| **Building:** 02 - Building A1 | | **Room:** | **02 - Custodial Closet - 5 x 6 x 9** | | | | |
| **Floor:** | Concrete | MISC | None Detected | 23 | 23A | 30 sq | |
| **Baseboard:** | Vinyl Baseboard Tile and Mastic | MISC | 2 % | 66 | 66A | 4 ln | No |
| | *Comment: Asbestos in both the tile and mastic of material.* | | | | | | |
| **Walls:** | 4" Ceramic Tile and Grout - Light Grey | MISC | None Detected | 22 | | 6 sq | |
| | *Comment: At mop sink in space.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 198 sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 30 sq | |
| **Building:** 02 - Building A1 | | **Room:** | **03 - Staff Restroom - 9 x 9 x 9** | | | | |
| **Floor:** | Linoleum & Mastic - Tan Pebble | MISC | None Detected | 24 | 24A | 81 sq | |
| **Baseboard:** | Linoleum & Mastic - Tan Pebble | MISC | None Detected | 24 | | 36 ln | |
| | *Comment: Floor material coved onto walls.* | | | | | | |
| **Walls:** | FRP and Glue - Smooth | MISC | None Detected | 25 | 25A | 162 sq | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 162 sq | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | 26A | 81 sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 4 ln | |
| | *Comment: At sink and toilet.* | | | | | | |
| *Room Comments:* | *Space being used for storage during inspection.* | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 02 - Building A1 | | **Room:** | **04 - Pipe Chase - 12 x 3 x 17** | | | | |
| **Floor:** | Dirt | NON | Non-Suspect | | | | |
| **Walls:** | Concrete | MISC | None Detected | 23 | | 204 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| | *Comment: Exposed wood studs.* | | | | | | |
| **Ceiling:** | Wood | NON | Non-Suspect | | | | |
| | *Comment: Roof Decking.* | | | | | | |
| *Room Comments:* | *Access located in Space 03 - Staff Restroom.* | | | | | | |
| **Building:** 02 - Building A1 | | **Room:** | **05 - Girls Restroom - 14 x 13 x 15** | | | | |
| **Floor:** | 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 182 sq | |
| **Baseboard:** | 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 54 ln | |
| | *Comment: Floor tile coved up wall ~6".* | | | | | | |
| **Walls:** | 4" Ceramic Tile and Grout - Grey | MISC | None Detected | 20 | | 405 sq | |
| | *Comment: Waincoting on walls.* | | | | | | |
| **Walls:** | 4" Ceramic Tile and Grout - Light Grey | MISC | None Detected | 22 | | 20 sq | |
| | *Comment: Patches, mostly at sinks.* | | | | | | |
| **Walls:** | Plaster - Smooth Finish | SURF | None Detected | 21 | 21A | 405 sq | |
| **Ceiling:** | Plaster - Smooth Finish | SURF | None Detected | 21 | | 182 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 8 ln | |
| | *Comment: At sinks and toilets.* | | | | | | |
| *Room Comments:* | *Sloped ceiling from ~17' to 11' in height.* | | | | | | |
| **Building:** 02 - Building A1 | | **Room:** | **06 - Classroom 21 - 32 x 30 x 10** | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | 11B | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Black Mastic Pucks | MISC | 7 % | 27 | | 50 sq | No |
| | *Comment: Visible at TV wall area (east wall).* | | | | | | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | 10A | 620 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Pressed Wood Panel | MISC | None Detected | 60 | 60B | 256 sq | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 960 sq | |
| | *Comment: Material visible at edges of FCPs and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 02 - Building A1 | **Room:** 07 - Classroom 22 - 32 x 30 x 10 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Black Mastic Pucks | MISC | 7 % | 27 | 27A | 50 sq | No |
| | *Comment: Visible at TV wall area (east wall).* | | | | | | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 620 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 960 sq | |
| | *Comment: Material visible at edges of FCPs and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | 4A | 960 sq | |
| **Building:** 02 - Building A1 | **Room:** 08 - Classroom 23 - 32 x 30 x 10 | | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Black Mastic Pucks | MISC | 7 % | 27 | | 50 sq | No |
| | *Comment: Visible at TV wall area (east wall).* | | | | | | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 620 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | 5B | 960 sq | |
| | *Comment: Material visible at edges of FCPs and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 02 - Building A1 | | **Room:** | **09 - Classroom 24 - 32 x 30 x 10** | | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 936 | sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 | sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 | ln | |
| **Walls:** | Black Mastic Pucks | MISC | 7 % | 27 | | 50 | sq | No |
| | *Comment: Visible at TV wall area (east wall).* | | | | | | | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 620 | sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | | |
| **Ceiling:** | 12" ACT - Uniform Holes | MISC | None Detected | 5 | | 960 | sq | |
| | *Comment: Material visible at edges of FCPs and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 | sq | |
| **Building:** 02 - Building A1 | | **Room:** | **10 - Exterior - 32 x 133 x 17** | | | | | |
| **Walls:** | Stucco | SURF | None Detected | 58 | 58B | 5610 | sq | |
| **Roofs:** | Comp Shingle Roofing - Grey | MISC | None Detected | 59 | 59C, 59D | 5852 | sq | |
| **Ground:** | Concrete | MISC | None Detected | 23 | | | | |
| **Door:** | Door / Window Frame System Sealant | MISC | 1 % | 68 | 68A | 160 | ln | No |
| | *Comment: Material at steel door and window system of classrooms. Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Roof:** | Grey Pebble HVAC Sealant | MISC | None Detected | 67 | 67A | 10 | sq | |
| **Overhangs:** | Stucco | SURF | None Detected | 58 | | 1596 | sq | |
| **Windows:** | Window Putty | MISC | 2 % | 62 | 62B | 400 | ln | No |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 03 - Building T
**Building Comment:** *Portable Classroom 25*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 03 - Building T | | **Room:** | **01 - Classroom 25 - 24 x 40 x 9** | | | | |
| **Floor:** | Carpet and Mastic - Tan Multi | MISC | None Detected | 28 | 28A | 960 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 128 ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | | 1152 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | | 960 sq | |
| **Building:** 03 - Building T | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Roof:** | Black Bolt Grommet | MISC | None Detected | 69 | 69A | 5 sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | |
| **Roofs:** | Metal | NON | Non-Suspect | | | | |

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|
| **Building:** 04 - Building B | **Room:** | **01 - Boys Restroom - 12 x 13 x 10** | | | | |
| **Floor:** 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 156 sq | |
| **Baseboard:** 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 50 ln | |
| *Comment: Floor material coved onto walls ~6".* | | | | | | |
| **Walls:** 4" Ceramic Tile & Grout - Green | MISC | None Detected | 32 | 32A | 250 sq | |
| *Comment: Material includes a mix of yellow, white, and lime accent tiles.* | | | | | | |
| **Walls:** Plaster - Smooth Finish | SURF | None Detected | 21 | | 250 sq | |
| **Ceiling:** 12" ACT - Random Holes | MISC | None Detected | 26 | | 156 sq | |
| *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Sink:** White Fixture Sealant | MISC | None Detected | 14 | | 14 ln | |
| *Comment: Material at sinks, urinals and toilets.* | | | | | | |
| **Building:** 04 - Building B | **Room:** | **02 - Staff Restroom - 8 x 10 x 8** | | | | |
| **Floor:** Linoleum & Mastic - Tan Pebble | MISC | None Detected | 24 | | 80 sq | |
| **Baseboard:** Linoleum & Mastic - Tan Pebble | MISC | None Detected | 24 | | 36 ln | |
| *Comment: Floor material coved onto walls.* | | | | | | |
| **Walls:** FRP and Glue - Smooth | MISC | None Detected | 25 | | 144 sq | |
| **Walls:** Plaster - Stipple Finish | SURF | None Detected | 17 | 17B | 144 sq | |
| **Ceiling:** 12" ACT - Random Holes | MISC | None Detected | 26 | | 80 sq | |
| *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Sink:** White Fixture Sealant | MISC | None Detected | 14 | | 4 ln | |
| **Building:** 04 - Building B | **Room:** | **03 - Pipe Chase - 4 x 9 x 10** | | | | |
| **Floor:** Concrete | MISC | None Detected | 23 | | 36 sq | |
| **Walls:** Wood | NON | Non-Suspect | | | | |
| *Comment: Exposed wood studs.* | | | | | | |
| **Ceiling:** Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 36 sq | No |
| *Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| *Room Comments:* *Accessed in Space 02 - Staff Restroom.* | | | | | | |

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# Functional Space Notes

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**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 04 - Building B | | **Room:** | **04 - Girls Restroom - 12 x 13 x 10** | | | | |
| **Floor:** | 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 156 sq | |
| **Baseboard:** | 1" Ceramic Tile and Grout - Brown | MISC | None Detected | 19 | | 50 ln | |
| | *Comment: Floor material coved onto walls ~6".* | | | | | | |
| **Walls:** | 4" Ceramic Tile & Grout - Green | MISC | None Detected | 32 | | 250 sq | |
| | *Comment: Material includes a mix of yellow, white, and lime accent tiles.* | | | | | | |
| **Walls:** | Plaster - Smooth Finish | SURF | None Detected | 21 | | 250 sq | |
| **Ceiling:** | Plaster - Smooth Finish | SURF | None Detected | 21 | | 156 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 10 ln | |
| | *Comment: Material at sinks and toilets.* | | | | | | |
| **Building:** 04 - Building B | | **Room:** | **05 - Classroom 31 - 32 x 30 x 10** | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | 2B | 124 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | 10B | 744 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | 13B | 120 sq | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 96 sq | |
| | *Comment: Accounts for material inside the storage closet.* | | | | | | |
| **Walls:** | Tackboard Panel | MISC | None Detected | 34 | | 64 sq | |
| | *Comment: Two panels installed over southside wood wall.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 20 sq | No |
| | *Comment: Ceiling in the storage closets. Material Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
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**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 04 - Building B | | **Room:** | **06 - Classroom 32 - 32 x 30 x 10** | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 744 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 96 sq | |
| | *Comment: Accounts for material inside the storage closet from Room 31.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 120 sq | |
| **Walls:** | Tackboard Panel | MISC | None Detected | 34 | 34A | 64 sq | |
| | *Comment: Two panels installed over southside wood wall.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Building:** 04 - Building B | | **Room:** | **07 - Classroom 33 - 32 x 30 x 10** | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | 11C | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 744 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 96 sq | |
| | *Comment: Accounts for material inside the storage closet from Room 34.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 120 sq | |
| **Walls:** | Tackboard Panel | MISC | None Detected | 34 | | 64 sq | |
| | *Comment: Two panels installed over southside wood wall.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 04 - Building B | | **Room:** | **08 - Classroom 34 - 32 x 30 x 10** | | | | |
| **Floor:** | 18" VFT & Mastic - Dark Grey Streak | MISC | None Detected | 11 | | 936 sq | |
| **Floor:** | Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | 9B | 24 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Canvas Wallpaper over Wood | MISC | 1 - 10 % | 10 | | 744 sq | No |
| | *Comment: Wallpaper and associated glue is the suspect material.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 120 sq | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 96 sq | |
| | *Comment: Accounts for material inside the storage closet.* | | | | | | |
| **Walls:** | Tackboard Panel | MISC | None Detected | 34 | | 64 sq | |
| | *Comment: Two panels installed over southside wood wall.* | | | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 20 sq | No |
| | *Comment: Ceiling in the storage closet. Material Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| **Building:** 04 - Building B | | **Room:** | **09 - Exterior - 32 x 133 x 17** | | | | |
| **Walls:** | Storefront System Sealant | MISC | None Detected | 82 | | 48 ln | |
| | *Comment: At restroom entries on east side of building.* | | | | | | |
| **Walls:** | Stucco | SURF | None Detected | 58 | 58C | 5610 sq | |
| **Windows:** | Aluminum Windows Putty | MISC | None Detected | 74 | 74A | 900 ln | |
| **Roof:** | Black Patch Mastic | MISC | None Detected | 70 | 70A | 30 sq | |
| **Roofs:** | Comp Shingle Roofing - Grey | MISC | None Detected | 59 | 59E, 59F | 5852 sq | |
| **Ground:** | Concrete | MISC | None Detected | 23 | | | |
| **Door:** | Door Frame Sealant - Blds B-E | MISC | 1 % | 71 | 71A | 80 ln | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | |
| **Windows:** | Light Grey Window Patch Putty | MISC | 2 % | 72 | 72A | 50 ln | No |
| **Overhangs:** | Stucco | SURF | None Detected | 58 | | 1596 sq | |
| **Windows:** | White Window Patch Sealant | MISC | 1 % | 61 | 61B | 50 ln | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 05 - Building S
**Building Comment:** *Portable Classroom 35*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 05 - Building S | | **Room:** | **01 - Classroom 35 - 23 x 40 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Blue-Green Lined | MISC | None Detected | 35 | 35A | 960 sq | |
| **Baseboard:** | 6" Baseboard and Mastic - Black | MISC | None Detected | 12 | 12B | 128 ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | 30A | 1152 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | | 960 sq | |
| **Building:** 05 - Building S | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Roof:** | Bolt Mastic | MISC | None Detected | 73 | 73A | 10 sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Roofs:** | Metal | NON | Non-Suspect | | | | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | |

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 06 - Building C | | **Room:** | **01 - Staff Kitchen - 17 x 24 x 10** | | | | |
| **Floor:** | VSF & Mastic - Tan-Grey Speckled | MISC | None Detected | 36 | 36A | 408 sq | |
| **Baseboard:** | 4" Baseboard & Mastic - Grey | MISC | None Detected | 37 | 37A | 82 ln | |
| **Walls:** | Vinyl-Covered Drywall | MISC | None Detected | 38 | 38A, 38B | 205 sq | |
| | *Comment: South Wall - At Restrooms* | | | | | | |
| **Walls:** | Vinyl-Covered Plaster | MISC | None Detected | 39 | 39A | 205 sq | |
| | *Comment: North Wall* | | | | | | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | | 410 sq | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 408 sq | |
| | *Comment: Material is nailed onto wood slats.* | | | | | | |
| **Sink:** | Grey Sink Coating | MISC | None Detected | 41 | 41A | 1 ea | |
| | *Comment: At stainless steel sink in space.* | | | | | | |
| **Building:** 06 - Building C | | **Room:** | **02 - Staff Restroom 1 - 8 x 6 x 8** | | | | |
| **Floor:** | Linoleum & Mastic - Blue Heathered | MISC | None Detected | 42 | 42A | 48 sq | |
| **Baseboard:** | Linoleum & Mastic - Blue Heathered | MISC | None Detected | 42 | | 28 ln | |
| | *Comment: Floor material coved onto walls.* | | | | | | |
| **Walls:** | FRP and Glue - Rough | MISC | None Detected | 43 | | 224 sq | |
| **Ceiling:** | 12" ACT & Mastic - Snowflakes | MISC | None Detected | 44 | 44A | 224 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 4 ln | |
| *Room Comments:* | *East Restroom* | | | | | | |
| **Building:** 06 - Building C | | **Room:** | **03 - Staff Restroom 2 - 8 x 6 x 8** | | | | |
| **Floor:** | Linoleum & Mastic - Blue Heathered | MISC | None Detected | 42 | | 48 sq | |
| **Baseboard:** | Linoleum & Mastic - Blue Heathered | MISC | None Detected | 42 | | 28 ln | |
| | *Comment: Floor material coved onto walls.* | | | | | | |
| **Walls:** | FRP and Glue - Rough | MISC | None Detected | 43 | 43A | 224 sq | |
| **Ceiling:** | 12" ACT & Mastic - Snowflakes | MISC | None Detected | 44 | | 224 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | | 4 ln | |
| *Room Comments:* | *West Restroom* | | | | | | |

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# Functional Space Notes

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**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 06 - Building C | | **Room:** | **04 - Classroom 41 - 32 x 30 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | | 768 sq | |
| **Floor:** | VSF & Mastic - White w/Blue Specks | MISC | 2 % | 45 | 45A | 192 sq | No |
| | *Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 70 sq | |
| | *Comment: Account for plaster inside the storage closet.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | 13C | 90 sq | |
| | *Comment: At storage closet in the space.* | | | | | | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | | 837 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Visible at the edges of the FCP system and extends above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |
| **Ceiling:** | Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 20 sq | No |
| | *Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| **Building:** 06 - Building C | | **Room:** | **05 - Classroom 42 - 32 x 30 x 9** | | | | |
| **Floor:** | Carpet and Mastic - Tan Multi | MISC | None Detected | 28 | | 960 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 90 sq | |
| | *Comment: At bump out of storage closet from Room 41.* | | | | | | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | 30B | 279 sq | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | 40A | 391 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | 26B | 960 sq | |
| | *Comment: Visible at edges of the FCP system and extends above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |

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# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 06 - Building C | **Room:** 06 - Classroom 43 - 32 x 30 x 9 | | | | | | |
| **Floor:** | Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | | 768 sq | |
| **Floor:** | Linoleum & Mastic - Mauve w/Blue Specks | MISC | 2 % | 47 | 47A | 192 sq | No |
| | *Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 90 sq | |
| | *Comment: At the storage closeout popout from Room 44 into the space.* | | | | | | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | | 837 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Visible at edge of FCP system and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | 4B | 960 sq | |
| **Building:** 06 - Building C | **Room:** 07 - Classroom 44 - 32 x 30 x 9 | | | | | | |
| **Floor:** | Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | | 768 sq | |
| **Floor:** | VSF & Mastic - White w/Blue Specks | MISC | 2 % | 45 | | 192 sq | No |
| | *Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 90 sq | |
| | *Comment: At storage closet in the space.* | | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 70 sq | |
| | *Comment: Account for plaster inside the storage closet.* | | | | | | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | | 837 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Visible at the edges of the FCP system and extends above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |
| **Ceiling:** | Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 20 sq | No |
| | *Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District

**Site:** James Monroe Elementary School

**HMS Project Number:** PJ87201

**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 06 - Building C | | **Room:** | **08 - Exterior - 32 x 133 x 17** | | | | |
| **Walls:** | Stucco | SURF | None Detected | 58 | 58D | 5610 sq | |
| **Windows:** | Aluminum Windows Putty | MISC | None Detected | 74 | 74B | 900 ln | |
| **Roof:** | Black Patch Mastic | MISC | None Detected | 70 | 70B | 20 sq | |
| **Roofs:** | Comp Shingle Roofing - Grey | MISC | None Detected | 59 | 59G, 59H | 5852 sq | |
| **Ground:** | Concrete | MISC | None Detected | 23 | | | |
| **Overhangs:** | Stucco | SURF | None Detected | 58 | | 1596 sq | |
| **Roof:** | White HVAC Sealant | MISC | None Detected | 64 | 64B | 10 sq | |
| *Comment: At penetraions and bolts of platform associated with HVAC units.* | | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 07 - Building R
**Building Comment:** *Portable Classroom 45*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 07 - Building R | | **Room:** | **01 - Classroom 45 - 23 x 40 x 9** | | | | | |
| **Floor:** | Carpet & Mastic - Blue | MISC | None Detected | 48 | 48A | 920 | sq | |
| **Baseboard:** | 4" Baseboard & Mastic - Brown | MISC | None Detected | 49 | 49A | 126 | ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | | 1134 | sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | 31A | 920 | sq | |
| **Building:** 07 - Building R | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | | |
| **Walls:** | Siding Sealant | MISC | None Detected | 75 | 75A | 400 | ln | |
| **Walls:** | Wood | NON | Non-Suspect | | | | | |
| **Roof:** | Bolt Mastic | MISC | None Detected | 73 | 73B | 10 | sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | | |
| **Ramp:** | Grey Ramp Coating | MISC | None Detected | 76 | 76A | 80 | sq | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | | |
| **Roofs:** | Metal | NON | Non-Suspect | | | | | |

# Functional Space Notes

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**Site:** James Monroe Elementary School
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**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 08 - Building D | **Room:** 01 - Boys Restroom - 12 x 13 x 10 | | | | | | |
| **Floor:** | 1" Ceramic Tile and Grout - Grey | MISC | None Detected | 51 | 51A | 12 sq | |
| **Floor:** | Terrazo - White-Brown | MISC | Assumed | 50 | | 144 sq | No |
| | *Comment: Material may contain a suspect moisture below. Destructive testing required to verify.* | | | | | | |
| **Baseboard:** | 1" Ceramic Tile and Grout - Grey | MISC | None Detected | 51 | | 7 sq | |
| **Baseboard:** | Terrazo - White-Brown | MISC | Assumed | 50 | | 43 ln | No |
| | *Comment: Material may contain a suspect moisture below. Destructive testing required to verify.* | | | | | | |
| **Walls:** | 4" Ceramic Tile & Grout - White w/Green | MISC | None Detected | 52 | | 250 sq | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 250 sq | |
| **Ceiling:** | Plaster - Smooth Finish | SURF | None Detected | 21 | | 156 sq | |
| **Sink:** | White Fixture Sealant | MISC | None Detected | 14 | 14B | 10 ln | |
| | *Comment: At sinks, urinals and toilets.* | | | | | | |
| **Building:** 08 - Building D | **Room:** 02 - Storage Closet - 8 x 10 x 8 | | | | | | |
| **Floor:** | Concrete | MISC | None Detected | 23 | | 80 sq | |
| **Baseboard:** | Wood | NON | Non-Suspect | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | 13D | 288 sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 80 sq | |
| **Building:** 08 - Building D | **Room:** 03 - Pipe Chase - 9 x 3 x 11 | | | | | | |
| **Floor:** | Dirt | NON | Non-Suspect | | | | |
| **Walls:** | Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | 33A | 264 sq | No |
| | *Comment: Visible mold on wall surface. Material Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| **Ceiling:** | Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 27 sq | No |
| | *Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| *Room Comments:* | *Accessible in Space 02 - Storage Closet.* | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|
| **Building:** 08 - Building D **Room:** 04 - Girls Restroom - 12 x 13 x 10 | | | | | | |
| **Floor:** Terrazo - White-Green | MISC | Assumed | 53 | | 156 sq | No |
| *Comment: Material may contain a suspect moisture barrier below. Destructice sampling required to verify.* | | | | | | |
| **Baseboard:** Terrazo - White-Green | MISC | Assumed | 53 | | 50 ln | No |
| *Comment: Material may contain a suspect moisture barrier below. Destructice sampling required to verify.* | | | | | | |
| **Walls:** 4" Ceramic Tile & Grout - White w/Green | MISC | None Detected | 52 | 52A | 250 sq | |
| **Walls:** Plaster - Rough Finish | SURF | None Detected | 13 | | 250 sq | |
| **Ceiling:** Plaster - Smooth Finish | SURF | None Detected | 21 | | 156 sq | |
| **Sink:** White Fixture Sealant | MISC | None Detected | 14 | | 10 ln | |
| *Comment: At sinks, urinals and toilets.* | | | | | | |
| **Building:** 08 - Building D **Room:** 05 - Classroom 51 - 32 x 30 x 9 | | | | | | |
| **Floor:** Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | 46A | 894 sq | |
| **Floor:** Linoleum & Mastic - Large Tan Pebble | MISC | None Detected | 77 | 77A | 6 sq | |
| **Floor:** Linoleum & Mastic - Mauve Pebble | MISC | None Detected | 54 | 54A | 66 sq | |
| *Comment: At entry and sink area in the room.* | | | | | | |
| **Baseboard:** 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | 29A | 124 ln | |
| **Walls:** Vinyl-Covered Wood | MISC | None Detected | 40 | | 893 sq | |
| **Walls:** Wood | NON | Non-Suspect | | | | |
| *Comment: At popout of heater closet in space.* | | | | | | |
| **Ceiling:** 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| *Comment: Visible at edge of FCP system and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | 4C | 960 sq | |
| **Building:** 08 - Building D **Room:** 06 - Classroom 52 - 32 x 30 x 9 | | | | | | |
| **Floor:** Carpet & Mastic - Black-Grey Walk Off | MISC | None Detected | 9 | | 18 sq | |
| **Floor:** Carpet and Mastic - Tan Multi | MISC | None Detected | 28 | | 894 sq | |
| **Floor:** VSF & Mastic - Tan-Grey Speckled | MISC | None Detected | 36 | | 48 sq | |
| *Comment: At sink area in room.* | | | | | | |
| **Baseboard:** 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** Vinyl-Covered Wood | MISC | None Detected | 40 | 40D | 893 sq | |
| **Walls:** Wood | NON | Non-Suspect | | | | |
| *Comment: At popout of the heater closet in the room.* | | | | | | |
| **Ceiling:** 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| *Comment: Material visible at edge of FCP system and extends above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |

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# Functional Space Notes

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| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 08 - Building D | | **Room:** | **07 - Classroom 53 - 32 x 30 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | | 894 sq | |
| **Floor:** | VSF & Mastic - White w/Blue Specks | MISC | 2 % | 45 | 45B | 66 sq | No |
| | *Comment: At entry and sink area in the room. Material Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | 40B, 40C | 893 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| | *Comment: At popout of heater closet in space.* | | | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | 26C | 960 sq | |
| | *Comment: Visible at edge of FCP system and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |
| **Building:** 08 - Building D | | **Room:** | **08 - Classroom 54 - 32 x 30 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | | 894 sq | |
| **Floor:** | VSF & Mastic - White w/Blue Specks | MISC | 2 % | 45 | | 66 sq | No |
| | *Comment: At entry and sink area in the room. Material Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** | Vinyl-Covered Wood | MISC | None Detected | 40 | | 893 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| | *Comment: At popout of heater closet in space.* | | | | | | |
| **Ceiling:** | 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| | *Comment: Visible at edge of FCP system and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |
| **Building:** 08 - Building D | | **Room:** | **09 - Heater Closet East - 5 x 6 x 8** | | | | |
| **Floor:** | Metal | NON | Non-Suspect | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 176 sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 30 sq | |
| **HVAC:** | Foil Tape | MISC | None Detected | 78 | | 16 ln | |
| **Building:** 08 - Building D | | **Room:** | **10 - Heater Closet West - 5 x 6 x 8** | | | | |
| **Floor:** | Metal | NON | Non-Suspect | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 176 sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 30 sq | |
| **HVAC:** | Foil Tape | MISC | None Detected | 78 | 78A | 16 ln | |

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| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 08 - Building D | | **Room:** | **11 - Exterior - 32 x 133 x 17** | | | | | |
| **Walls:** | Storefront System Sealant | MISC | None Detected | 82 | | 48 | ln | |
| | *Comment: At restroom entries on east side of building.* | | | | | | | |
| **Walls:** | Stucco | SURF | None Detected | 58 | | 5610 | sq | |
| **Roofs:** | Comp Shingle Roofing - Grey | MISC | None Detected | 59 | 59I, 59J | 5852 | sq | |
| **Ground:** | Concrete | MISC | None Detected | 23 | | | | |
| **Door:** | Door Frame Sealant - Blds B-E | MISC | 1 % | 71 | 71B | 80 | ln | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Roof:** | Light Grey Penetration Sealant | MISC | None Detected | 81 | 81A | 4 | sq | |
| | *Comment: At newer pipe penetration for HVAC units.* | | | | | | | |
| **Overhangs:** | Stucco | SURF | None Detected | 58 | 58E | 1596 | sq | |
| **Windows:** | Thin White Window Putty | MISC | 1 % | 79 | 79A | 200 | ln | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Windows:** | Window Frame Sealant | MISC | None Detected | 80 | 80A | 220 | ln | |
| | *Comment: Between building opening and metal window frame system.* | | | | | | | |
| **Windows:** | Window Trim Glue | MISC | None Detected | 83 | 83B | 100 | sq | |
| | *Comment: Material behind vertical trim pieces of aluminium windows.* | | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 09 - Building Q
**Building Comment:** *Portable Classroom 55*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 09 - Building Q | | **Room:** | **01 - Classroom 55 - 23 x 40 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Blue-Green Lined | MISC | None Detected | 35 | | 920 sq | |
| **Baseboard:** | 6" Baseboard and Mastic - Black | MISC | None Detected | 12 | | 126 ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | 30C | 1134 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | | 920 sq | |
| **Building:** 09 - Building Q | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Roofs:** | Bolt Mastic | MISC | None Detected | 73 | 73C | 10 sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | |
| **Roof:** | Metal | NON | Non-Suspect | | | | |

FACS
Forensic Analytical Consulting Services

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|
| **Building:** 10 - Building E | **Room:** **01 - Boys Restroom - 12 x 13 x 10** | | | | | |
| **Floor:** 1" Ceramic Tile and Grout - Grey | MISC | None Detected | 51 | | 18 sq | |
| *Comment: Patch at urinals in room.* | | | | | | |
| **Floor:** Terrazo - White-Brown | MISC | Assumed | 50 | | 138 sq | No |
| *Comment: Material may contain a suspect moisture below. Destructive testing required to verify.* | | | | | | |
| **Baseboard:** 1" Ceramic Tile and Grout - Grey | MISC | None Detected | 51 | | 9 sq | |
| **Baseboard:** Terrazo - White-Brown | MISC | Assumed | 50 | | 41 ln | No |
| *Comment: Floor material coved onto wall. Material Comment: Material may contain a suspect moisture below. Destructive testing required to verify.* | | | | | | |
| **Walls:** 4" Ceramic Tile & Grout - White w/Green | MISC | None Detected | 52 | | 250 sq | |
| *Comment: Waincoating on lower portion of walls.* | | | | | | |
| **Walls:** Plaster - Rough Finish | SURF | None Detected | 13 | | 250 sq | |
| **Ceiling:** Plaster - Smooth Finish | SURF | None Detected | 21 | | 156 sq | |
| **Sink:** White Fixture Sealant | MISC | None Detected | 14 | | 8 ln | |
| *Comment: At sinks, urinals and toilet.* | | | | | | |
| **Building:** 10 - Building E | **Room:** **02 - Washer Room - 9 x 8 x 8** | | | | | |
| **Floor:** Concrete | MISC | None Detected | 23 | 23B | 72 sq | |
| **Walls:** Plaster - Rough Finish | SURF | None Detected | 13 | | 272 sq | |
| **Ceiling:** Plaster - Rough Finish | SURF | None Detected | 13 | | 72 sq | |
| **Building:** 10 - Building E | **Room:** **03 - Pipe Chase - 9 x 3 x 9** | | | | | |
| **Floor:** Concrete | MISC | None Detected | 23 | | 27 sq | |
| **Walls:** Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | 33B | 216 sq | No |
| *Comment: Visible mold on walls. Material Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| **Ceiling:** Drywall - Tape and Joint Compound Only | MISC | 2 % | 33 | | 27 sq | No |
| *Comment: Point-count of material not performed and will need to be treated as RACM.* | | | | | | |
| *Room Comments: Located in Space 02 - Washer Room.* | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|
| **Building:** 10 - Building E | **Room:** 04 - Girls Restroom - 12 x 13 x 10 | | | | | |
| **Floor:** Terrazo - White-Green | MISC | Assumed | 53 | | 156 sq | No |
| *Comment: Material may contain a suspect moisture barrier below. Destructice sampling required to verify.* | | | | | | |
| **Baseboard:** Terrazo - White-Green | MISC | Assumed | 53 | | 50 ln | No |
| *Comment: Floor material coved onto wall. Material Comment: Material may contain a suspect moisture barrier below. Destructice sampling required to verify.* | | | | | | |
| **Walls:** 4" Ceramic Tile & Grout - White w/Green | MISC | None Detected | 52 | | 250 sq | |
| *Comment: Waincoating on lower portion of walls.* | | | | | | |
| **Walls:** Plaster - Rough Finish | SURF | None Detected | 13 | | 250 sq | |
| **Ceiling:** Plaster - Smooth Finish | SURF | None Detected | 21 | | 156 sq | |
| **Sink:** White Fixture Sealant | MISC | None Detected | 14 | | 8 ln | |
| *Comment: At sinks and toilets.* | | | | | | |
| **Building:** 10 - Building E | **Room:** 05 - Classroom 61 - 30 x 32 x 9 | | | | | |
| **Floor:** Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | | 894 sq | |
| **Floor:** VSF & Mastic - White w/Blue Specks | MISC | 2 % | 45 | | 66 sq | No |
| *Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** Vinyl-Covered Wood | MISC | None Detected | 40 | 40F, 40G | 893 sq | |
| **Walls:** Wood | NON | Non-Suspect | | | | |
| *Comment: At popout of heater closet in the room.* | | | | | | |
| **Ceiling:** 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| *Comment: Visible at edge of FCP system and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |
| **Building:** 10 - Building E | **Room:** 06 - Classroom 62 - 30 x 32 x 9 | | | | | |
| **Floor:** Carpet & Mastic - Purple Multi | MISC | None Detected | 46 | 46B | 894 sq | |
| **Floor:** VSF & Mastic - White w/Blue Specks | MISC | 2 % | 45 | | 66 sq | No |
| *Comment: Asbestos in the black mastic layer below the flooring.* | | | | | | |
| **Baseboard:** 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** Vinyl-Covered Wood | MISC | None Detected | 40 | 40E | 893 sq | |
| **Walls:** Wood | NON | Non-Suspect | | | | |
| *Comment: At popout of heater closet in the room.* | | | | | | |
| **Ceiling:** 12" ACT - Random Holes | MISC | None Detected | 26 | | 960 sq | |
| *Comment: Visible at edge of FCP system and extend above the FCPs. Material Comment: Material is nailed onto wood slats.* | | | | | | |
| **Ceiling:** 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 960 sq | |

FACS
Forensic Analytical Consulting Services

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 10 - Building E | | **Room:** | **07 - Exterior Heater Closet - 6 x 5 x 8** | | | | | |
| **Floor:** | Metal | NON | Non-Suspect | | | | | |
| **Walls:** | Plaster - Rough Finish | SURF | None Detected | 13 | 13E | 176 | sq | |
| **Ceiling:** | Plaster - Rough Finish | SURF | None Detected | 13 | | 30 | sq | |
| **HVAC:** | Foil Tape | MISC | None Detected | 78 | | 16 | ln | |
| **Building:** 10 - Building E | | **Room:** | **08 - Exterior - 72 x 32 x 17** | | | | | |
| **Walls:** | Storefront System Sealant | MISC | None Detected | 82 | 82A | 48 | ln | |
| | *Comment: At restroom entries on east side of building.* | | | | | | | |
| **Walls:** | Stucco | SURF | None Detected | 58 | 58F | 3536 | sq | |
| **Roofs:** | Comp Shingle Roofing - Grey | MISC | None Detected | 59 | 59K, 59L | 3168 | sq | |
| **Ground:** | Concrete | MISC | None Detected | 23 | | | | |
| **Overhangs:** | Stucco | SURF | None Detected | 58 | | 864 | sq | |
| **Windows:** | Thin White Window Putty | MISC | 1 % | 79 | 79B | 200 | ln | No |
| | *Comment: Trace material not point counted and must be treated as more than 1% asbestos.* | | | | | | | |
| **Windows:** | Window Trim Glue | MISC | None Detected | 83 | 83A | 100 | ln | |
| | *Comment: Material behind vertical trim pieces of aluminium windows.* | | | | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 11 - Building K
**Building Comment:** *Portable Classroom 63*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 11 - Building K | | **Room:** | **01 - Classroom 63 - 29 x 33 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Black Walk Off | SURF | None Detected | 1 | | 18 sq | |
| **Floor:** | Carpet & Mastic - Tan-Blue Multi | MISC | None Detected | 6 | | 939 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | | 124 ln | |
| **Walls:** | Tackboard - Grey | MISC | None Detected | 55 | 55A | 1116 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | 31B | 957 sq | |
| **Building:** 11 - Building K | | **Room:** | **02 - Exterior - 29 x 33 x 13** | | | | |
| **Walls:** | Portable Conjoining Sealant | MISC | None Detected | 84 | 84A | 26 ln | |
| | *Comment: Material at center seam of two portable halves.* | | | | | | |
| **Walls:** | Portable Trim Sealant | MISC | None Detected | 86 | 86A | 160 ln | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Roofs:** | Single-Ply Roofing | MISC | None Detected | 85 | 85A, 85B | 1077 sq | |
| **Overhangs:** | Wood | NON | Non-Suspect | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 12 - Building L
**Building Comment:** *Portable Classroom 64*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 12 - Building L | | **Room:** | **01 - Classroom 64 - 23 x 39 x 9** | | | | |
| **Floor:** | Carpet & Mastic - Blue-Green Lined | MISC | None Detected | 35 | 35B | 897 sq | |
| **Baseboard:** | 6" Baseboard and Mastic - Black | MISC | None Detected | 12 | | 124 ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | | 1116 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | | 897 sq | |
| **Building:** 12 - Building L | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | |
| **Roofs:** | Bolt Mastic | MISC | None Detected | 73 | | 10 sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Roof:** | Metal | NON | Non-Suspect | | | | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 13 - Building H
**Building Comment:** *Portable Classroom 71*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | | Friable? Yes/No |
|---|---|---|---|---|---|---|---|---|
| **Building:** 13 - Building H | | **Room:** | **01 - Classroom 71 - 32 x 29 x 9** | | | | | |
| **Floor:** | Carpet & Mastic - Tan-Blue Multi | MISC | None Detected | 6 | 6B | 928 | sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Black | MISC | None Detected | 2 | 2C | 122 | ln | |
| **Walls:** | Tackboard - White | MISC | None Detected | 56 | 56A | 878 | sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | | |
| | *Comment: Window / Wall Panel system at south wall of room.* | | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | | 928 | sq | |
| **Building:** 13 - Building H | | **Room:** | **02 - Exterior - 32 x 30 x 13** | | | | | |
| **Walls:** | Storefront System Sealant - Portables | MISC | 2 % | 88 | 88A | 100 | ln | No |
| **Walls:** | Texture Siding Sealant | MISC | 2 % | 90 | | 80 | ln | No |
| **Walls:** | Textured Wood Siding | MISC | 2 % | 87 | 87A | 1612 | sq | No |
| **Ground:** | Dirt | NON | Non-Suspect | | | | | |
| **Roofs:** | Metal with White Sealant | MISC | None Detected | 89 | | 960 | sq | |
| **Windows:** | Storefront System Window Putty | MISC | 3 % | 91 | | 36 | ln | No |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 14 - Building J
**Building Comment:** *Portable Classroom 72*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 14 - Building J | | **Room:** | **01 - Classroom 72 - 32 x 29 x 9** | | | | |
| **Floor:** | Carpet and Mastic - Tan Multi | MISC | None Detected | 28 | | 900 sq | |
| **Floor:** | VSF & Mastic - Tan-Grey Speckled | MISC | None Detected | 36 | | 28 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Tan | MISC | None Detected | 57 | 57A | 122 ln | |
| **Walls:** | Tackboard - White | MISC | None Detected | 56 | 56B | 878 sq | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| | *Comment: Window - Wall Panel System at south wall of room.* | | | | | | |
| **Ceiling:** | 2' x 4' FCP - Pinhole - Fissure | MISC | None Detected | 4 | 4D | 928 sq | |
| **Building:** 14 - Building J | | **Room:** | **02 - Exterior - 32 x 30 x 13** | | | | |
| **Walls:** | Storefront System Sealant - Portables | MISC | 2 % | 88 | | 160 ln | No |
| **Walls:** | Texture Siding Sealant | MISC | 2 % | 90 | 90A | 80 ln | No |
| | *Comment: At corners of portable* | | | | | | |
| **Walls:** | Textured Wood Siding | MISC | 2 % | 87 | 87B, 87C | 1612 sq | No |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Roofs:** | Metal with White Sealant | MISC | None Detected | 89 | 89A, 89B | 960 sq | |
| **Windows:** | Storefront System Window Putty | MISC | 3 % | 91 | 91A | 36 ln | No |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 15 - Building M
**Building Comment:** *Portable Classroom 74*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 15 - Building M | | **Room:** | **01 - Classroom 74 - 23 x 39 x 9** | | | | |
| **Floor:** | Carpet and Mastic - Tan Multi | MISC | None Detected | 28 | 28B | 897 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | | 124 ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | | 1116 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | | 897 sq | |
| **Building:** 15 - Building M | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | |
| **Walls:** | Portable Siding Sealant | MISC | None Detected | 92 | 92A | 80 ln | |
| **Walls:** | Wood | NON | Non-Suspect | | | | |
| **Roof:** | Bolt Mastic | MISC | None Detected | 73 | | 10 sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | |
| **Roofs:** | Metal | NON | Non-Suspect | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 16 - Building N
**Building Comment:** *Portable Classroom 75*

| Materials | | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|---|
| **Building:** 16 - Building N | | **Room:** | **01 - Classroom 75 - 23 x 39 x 9** | | | | |
| **Floor:** | Carpet and Mastic - Tan Multi | MISC | None Detected | 28 | | 897 sq | |
| **Baseboard:** | 4" Baseboard and Mastic - Blue | MISC | None Detected | 29 | 29B | 124 ln | |
| **Walls:** | Tackboard | MISC | None Detected | 30 | 30D | 1116 sq | |
| **Ceiling:** | 2' x 4' FCP - Fiberglass | MISC | None Detected | 31 | | 897 sq | |
| **Building:** 16 - Building N | | **Room:** | **02 - Exterior - 24 x 40 x 13** | | | | |
| **Walls:** | Portable Siding Sealant | MISC | None Detected | 92 | 92B | 80 ln | |
| **Roof:** | Bolt Mastic | MISC | None Detected | 73 | | 10 sq | |
| **Ground:** | Dirt | NON | Non-Suspect | | | | |
| **Overhangs:** | Metal | NON | Non-Suspect | | | | |
| **Roofs:** | Metal | NON | Non-Suspect | | | | |

# Functional Space Notes

## Forensic Analytical Consulting Services, Inc.

**Client:** Hanford Elementary School District
**Site:** James Monroe Elementary School
**HMS Project Number:** PJ87201
**Date of Inspection:** July 15, 2025

**Building:** 17 - Service Yard
**Building Comment:** *Located at northeast side of A1 in a fenced off area.*

| Materials | Material Class | Percent Asbestos | Hmgns Matrl # | Sampled Here? | Footage Sq/Ln/Jnts | Friable? Yes/No |
|---|---|---|---|---|---|---|
| **Building:** 17 - Service Yard | **Room:** Service Yard - 20 x 20 x 8 | | | | | |
| **Ground:** Concrete | MISC | None Detected | 23 | | 100 sq | |
| *Comment: Slabs at tank, valves, and electrical equipment.* | | | | | | |
| **Pipes:** Valve Gasket - Black | MISC | None Detected | 94 | 94A | 1 ea | |
| *Comment: Northeast side of yard.* | | | | | | |
| **Pipes:** Valve Gasket - Green | MISC | None Detected | 93 | 93A | 2 ea | |
| *Comment: Southeast side of yard.* | | | | | | |

# Bulk Material Analysis Request Form

**Forensic Analytical Consulting Services, Inc.**

**Modesto**
**P.O. Box 576848**
**Modesto, CA 95356**
**(209) 551 - 2000**
**FAX: (209) 575 - 5657**

| | | | |
|---|---|---|---|
| **Date Submitted:** | 07/18/25 | **Analysis Requested:** | **PLM with Dispersion Staining** |
| **Contact:** | Chris Chipponeri | **Turn Around Time:** | **5 DAY** |
| **Collected By:** | Chris Chipponeri | **Laboratory:** | SGS Forensic Laboratories |
| **Date(s) Collected:** | 07/18/25 | **Special Instructions:** | Please email results to chris.c@facs.com |
| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-1A | Carpet & Mastic - Black Walk Off<br>01 - Building A, 01 - Room 10 Office, South side of entry |
| PJ87201-2A | 4" Baseboard and Mastic - Black<br>01 - Building A, 09 - Classroom 12 Work Space, North wall |
| PJ87201-2B | 4" Baseboard and Mastic - Black<br>04 - Building B, 05 - Classroom 31, North wall, west end |
| PJ87201-2C | 4" Baseboard and Mastic - Black<br>13 - Building H, 01 - Classroom 71, NE corner |
| PJ87201-3A | Canvas Wallpaper over Plaster<br>01 - Building A, 05 - Classroom 11 Work Room, North side center |
| PJ87201-3B | Canvas Wallpaper over Plaster<br>01 - Building A, 01 - Room 10 Office, East wall |
| PJ87201-4A | 2' x 4' FCP - Pinhole - Fissure<br>02 - Building A1, 07 - Classroom 22, West side south |
| PJ87201-4B | 2' x 4' FCP - Pinhole - Fissure<br>06 - Building C, 06 - Classroom 43, West side center |
| PJ87201-4C | 2' x 4' FCP - Pinhole - Fissure<br>08 - Building D, 05 - Classroom 51, SE side of room |
| PJ87201-4D | 2' x 4' FCP - Pinhole - Fissure<br>14 - Building J, 01 - Classroom 72, NW side |
| PJ87201-5A | 12" ACT - Uniform Holes<br>01 - Building A, 03 - Classroom 11, North side above door. |
| PJ87201-5B | 12" ACT - Uniform Holes<br>02 - Building A1, 08 - Classroom 23, South side center |
| PJ87201-6A | Carpet & Mastic - Tan-Blue Multi<br>01 - Building A, 01 - Room 10 Office, East side center |
| PJ87201-6B | Carpet & Mastic - Tan-Blue Multi<br>13 - Building H, 01 - Classroom 71, West side south end |
| PJ87201-7A | Canvas Wallpaper over Drywall<br>01 - Building A, 01 - Room 10 Office, NW Corner Comment: With Joint Compound |
| PJ87201-7B | Canvas Wallpaper over Drywall<br>01 - Building A, 01 - Room 10 Office, North side center Comment: Without Joint Compound |
| PJ87201-8A | Drywall - Stipple Texture<br>01 - Building A, 02 - Storage Room, South side center Comment: Without joint compound |

**Submitted By:** [signature] **Date Submitted:** 07/18/25 **Submitted Via:** Fedex

**Received By:** MC **Date Received:** 7/21/25 **Received Via:** 10Fp

**Date Printed:** 7/18/2025

# Bulk Material Analysis Request Form

**Forensic Analytical Consulting Services, Inc.**

**Modesto**
**P.O. Box 576848**
**Modesto, CA 95356**
**(209) 551 - 2000**
**FAX: (209) 575 - 5657**

| | | | |
|---|---|---|---|
| **Date Submitted:** | 07/18/25 | **Analysis Requested:** | **PLM with Dispersion Staining** |
| **Contact:** | Chris Chipponeri | **Turn Around Time:** | **5 DAY** |
| **Collected By:** | Chris Chipponeri | **Laboratory:** | SGS Forensic Laboratories |
| **Date(s) Collected:** | 07/18/25 | **Special Instructions:** | Please email results to chris.c@facs.com |
| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-8B | Drywall - Stipple Texture<br>01 - Building A, 03 - Classroom 11, With Joint Compound |
| PJ87201-9A | Carpet & Mastic - Black-Grey Walk Off<br>01 - Building A, 03 - Classroom 11, SE side of SE walkoff |
| PJ87201-9B | Carpet & Mastic - Black-Grey Walk Off<br>04 - Building B, 08 - Classroom 34, SE corner |
| PJ87201-10A | Canvas Wallpaper over Wood<br>02 - Building A1, 06 - Classroom 21, West wall south end |
| PJ87201-10B | Canvas Wallpaper over Wood<br>04 - Building B, 05 - Classroom 31, West wall south side |
| PJ87201-11A | 18" VFT & Mastic - Dark Grey Streak<br>01 - Building A, 03 - Classroom 11, NW corner |
| PJ87201-11B | 18" VFT & Mastic - Dark Grey Streak<br>02 - Building A1, 06 - Classroom 21, NE corner |
| PJ87201-11C | 18" VFT & Mastic - Dark Grey Streak<br>04 - Building B, 07 - Classroom 33, NW corner |
| PJ87201-12A | 6" Baseboard and Mastic - Black<br>01 - Building A, 08 - Classroom 12 Restrooms, NE corner of east restroom |
| PJ87201-12B | 6" Baseboard and Mastic - Black<br>05 - Building S, 01 - Classroom 35, South wall east end |
| PJ87201-13A | Plaster - Rough Finish<br>01 - Building A, 06 - Classroom 11 Storage, South side center |
| PJ87201-13B | Plaster - Rough Finish<br>04 - Building B, 05 - Classroom 31, Inside storage closet, NE corner |
| PJ87201-13C | Plaster - Rough Finish<br>06 - Building C, 04 - Classroom 41, SE corner in closet. |
| PJ87201-13D | Plaster - Rough Finish<br>08 - Building D, 02 - Storage Closet, South side center |
| PJ87201-13E | Plaster - Rough Finish<br>10 - Building E, 07 - Exterior Heater Closet, West side center |
| PJ87201-14A | White Fixture Sealant<br>01 - Building A, 08 - Classroom 12 Restrooms, West side of west sink |
| PJ87201-14B | White Fixture Sealant<br>08 - Building D, 01 - Boys Restroom, From sink |

**Submitted By:** CC **Date Submitted:** 07/18/25 **Submitted Via:** FedEx

**Received By:** MC **Date Received:** 7/21/25 **Received Via:** 10FP

**Date Printed:** 7/18/2025

# Bulk Material Analysis Request Form

**Forensic Analytical Consulting Services, Inc.**

**Modesto**
**P.O. Box 576848**
**Modesto, CA 95356**
**(209) 551 - 2000**
**FAX: (209) 575 - 5657**

| | | | |
|---|---|---|---|
| **Date Submitted:** | 07/18/25 | **Analysis Requested:** | **PLM with Dispersion Staining** |
| **Contact:** | Chris Chipponeri | **Turn Around Time:** | **5 DAY** |
| **Collected By:** | Chris Chipponeri | **Laboratory:** | SGS Forensic Laboratories |
| **Date(s) Collected:** | 07/18/25 | **Special Instructions:** | Please email results to chris.c@facs.com |
| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-15A | 12" VFT & Mastic - White Oatmeal<br>01 - Building A, 06 - Classroom 11 Storage, SE corner |
| PJ87201-15B | 12" VFT & Mastic - White Oatmeal<br>01 - Building A, 10 - Classroom 12 Storage Closet, West side of threshold |
| PJ87201-16A | 6" Baseboard & Mastic - Grey<br>01 - Building A, 10 - Classroom 12 Storage Closet, East wall south end |
| PJ87201-16B | 6" Baseboard & Mastic - Grey<br>01 - Building A, 06 - Classroom 11 Storage, South wall center |
| PJ87201-17A | Plaster - Stipple Finish<br>01 - Building A, 06 - Classroom 11 Storage, SW Corner |
| PJ87201-17B | Plaster - Stipple Finish<br>04 - Building B, 02 - Staff Restroom, SE corner |
| PJ87201-18A | Counter Sealant<br>01 - Building A, 07 - Classroom 12, At lower sink cabiet north end |
| PJ87201-19A | 1" Ceramic Tile and Grout - Brown<br>02 - Building A1, 01 - Boys Restroom, East side center |
| PJ87201-20A | 4" Ceramic Tile and Grout - Grey<br>02 - Building A1, 01 - Boys Restroom, East side center |
| PJ87201-21A | Plaster - Smooth Finish<br>02 - Building A1, 05 - Girls Restroom, SE corner |
| PJ87201-21B | Plaster - Smooth Finish<br>02 - Building A1, 01 - Boys Restroom, NW corner |
| PJ87201-22A | 4" Ceramic Tile and Grout - Light Grey<br>02 - Building A1, 01 - Boys Restroom, West side center |
| PJ87201-23A | Concrete<br>02 - Building A1, 02 - Custodial Closet, At south side of threshold |
| PJ87201-23B | Concrete<br>10 - Building E, 02 - Washer Room, At east side of threshold at damage |
| PJ87201-24A | Linoleum & Mastic - Tan Pebble<br>02 - Building A1, 03 - Staff Restroom, At SE side of floor below sink |
| PJ87201-25A | FRP and Glue - Smooth<br>02 - Building A1, 03 - Staff Restroom, East side center |
| PJ87201-26A | 12" ACT - Random Holes<br>02 - Building A1, 03 - Staff Restroom, East side center |

**Submitted By:** Ch Chp **Date Submitted:** 07/18/25 **Submitted Via:** FedEx

**Received By:** MC **Date Received:** 7/21/25 **Received Via:** UPS

**Date Printed:** 7/18/2025

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| **Contact:** | Chris Chipponeri | **Turn Around Time:** | **5 DAY** |
| **Collected By:** | Chris Chipponeri | **Laboratory:** | SGS Forensic Laboratories |
| **Date(s) Collected:** | 07/18/25 | **Special Instructions:** | Please email results to chris.c@facs.com |
| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-26B | 12" ACT - Random Holes<br>06 - Building C, 05 - Classroom 42, South side center |
| PJ87201-26C | 12" ACT - Random Holes<br>08 - Building D, 07 - Classroom 53, Southside east end |
| PJ87201-27A | Black Mastic Pucks<br>02 - Building A1, 07 - Classroom 22, East wall |
| PJ87201-28A | Carpet and Mastic - Tan Multi<br>03 - Building T, 01 - Classroom 25, SE corner |
| PJ87201-28B | Carpet and Mastic - Tan Multi<br>15 - Building M, 01 - Classroom 74, South side center |
| PJ87201-29A | 4" Baseboard and Mastic - Blue<br>08 - Building D, 05 - Classroom 51, South side east end at door |
| PJ87201-29B | 4" Baseboard and Mastic - Blue<br>16 - Building N, 01 - Classroom 75, West wall south end |
| PJ87201-30A | Tackboard<br>05 - Building S, 01 - Classroom 35, NE corner |
| PJ87201-30B | Tackboard<br>06 - Building C, 05 - Classroom 42, South wall east end |
| PJ87201-30C | Tackboard<br>09 - Building Q, 01 - Classroom 55, SW corner |
| PJ87201-30D | Tackboard<br>16 - Building N, 01 - Classroom 75, South wall center |
| PJ87201-31A | 2' x 4' FCP - Fiberglass<br>07 - Building R, 01 - Classroom 45, South side center |
| PJ87201-31B | 2' x 4' FCP - Fiberglass<br>11 - Building K, 01 - Classroom 63, Center |
| PJ87201-32A | 4" Ceramic Tile & Grout - Green<br>04 - Building B, 01 - Boys Restroom, NE Corner |
| PJ87201-33A | Drywall - Tape and Joint Compound Only<br>08 - Building D, 03 - Pipe Chase, Southeast side Comment: With joint compound |
| PJ87201-33B | Drywall - Tape and Joint Compound Only<br>10 - Building E, 03 - Pipe Chase, NE corner Comment: With Joint Compound |
| PJ87201-34A | Tackboard Panel<br>04 - Building B, 06 - Classroom 32, South wall east side |

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**Modesto, CA 95356**
**(209) 551 - 2000**
**FAX: (209) 575 - 5657**

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| **Date Submitted:** | 07/18/25 | **Analysis Requested:** | **PLM with Dispersion Staining** |
| **Contact:** | Chris Chipponeri | **Turn Around Time:** | **5 DAY** |
| **Collected By:** | Chris Chipponeri | **Laboratory:** | SGS Forensic Laboratories |
| **Date(s) Collected:** | 07/18/25 | **Special Instructions:** | Please email results to chris.c@facs.com |
| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-35A | Carpet & Mastic - Blue-Green Lined<br>05 - Building S, 01 - Classroom 35, NE corner |
| PJ87201-35B | Carpet & Mastic - Blue-Green Lined<br>12 - Building L, 01 - Classroom 64, SW corner |
| PJ87201-36A | VSF & Mastic - Tan-Grey Speckled<br>06 - Building C, 01 - Staff Kitchen, NE corner |
| PJ87201-37A | 4" Baseboard & Mastic - Grey<br>06 - Building C, 01 - Staff Kitchen, East wall south end |
| PJ87201-38A | Vinyl-Covered Drywall<br>06 - Building C, 01 - Staff Kitchen, SE Corner Comment: With Joint Compound |
| PJ87201-38B | Vinyl-Covered Drywall<br>06 - Building C, 01 - Staff Kitchen, Northwest side Comment: Without Joint Compound |
| PJ87201-39A | Vinyl-Covered Plaster<br>06 - Building C, 01 - Staff Kitchen, SW corner |
| PJ87201-40A | Vinyl-Covered Wood<br>06 - Building C, 05 - Classroom 42, North wall, east end |
| PJ87201-40B | Vinyl-Covered Wood<br>08 - Building D, 07 - Classroom 53, South wall west end |
| PJ87201-40C | Vinyl-Covered Wood<br>08 - Building D, 07 - Classroom 53, South wall east end Comment: Core sample of potential tackboard below. |
| PJ87201-40D | Vinyl-Covered Wood<br>08 - Building D, 06 - Classroom 52, South side center Comment: Core sample with potential tackboard below vinyl |
| PJ87201-40E | Vinyl-Covered Wood<br>10 - Building E, 06 - Classroom 62, West wall south end Comment: Core sample with potential tackboard material |
| PJ87201-40F | Vinyl-Covered Wood<br>10 - Building E, 05 - Classroom 61, South wall east end Comment: Core sample with tackboard material |
| PJ87201-40G | Vinyl-Covered Wood<br>10 - Building E, 05 - Classroom 61, North wall west end |
| PJ87201-41A | Grey Sink Coating<br>06 - Building C, 01 - Staff Kitchen, At bottom of sink, NE side |
| PJ87201-42A | Linoleum & Mastic - Blue Heathered<br>06 - Building C, 02 - Staff Restroom 1, SE corner |

**Submitted By:** Ch Chipponeri **Date Submitted:** 07/18/25 **Submitted Via:** FedEx

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**Date Printed:** 7/18/2025

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**Modesto**
**P.O. Box 576848**
**Modesto, CA 95356**
**(209) 551 - 2000**
**FAX: (209) 575 - 5657**

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| **Date Submitted:** | 07/18/25 | **Analysis Requested:** | **PLM with Dispersion Staining** |
| **Contact:** | Chris Chipponeri | **Turn Around Time:** | **5 DAY** |
| **Collected By:** | Chris Chipponeri | **Laboratory:** | SGS Forensic Laboratories |
| **Date(s) Collected:** | 07/18/25 | **Special Instructions:** | Please email results to chris.c@facs.com |
| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-43A | FRP and Glue - Rough<br>06 - Building C, 03 - Staff Restroom 2, NW corner |
| PJ87201-44A | 12" ACT & Mastic - Snowflakes<br>06 - Building C, 02 - Staff Restroom 1, SW side |
| PJ87201-45A | VSF & Mastic - White w/Blue Specks<br>06 - Building C, 04 - Classroom 41, West side center |
| PJ87201-45B | VSF & Mastic - White w/Blue Specks<br>08 - Building D, 07 - Classroom 53, At sink cabinet |
| PJ87201-46A | Carpet & Mastic - Purple Multi<br>08 - Building D, 05 - Classroom 51, NW corner |
| PJ87201-46B | Carpet & Mastic - Purple Multi<br>10 - Building E, 06 - Classroom 62, SW corner |
| PJ87201-47A | Linoleum & Mastic - Mauve w/Blue Specks<br>06 - Building C, 06 - Classroom 43, SW corner |
| PJ87201-48A | Carpet & Mastic - Blue<br>07 - Building R, 01 - Classroom 45, NW Corner |
| PJ87201-49A | 4" Baseboard & Mastic - Brown<br>07 - Building R, 01 - Classroom 45, SW corner |
| PJ87201-51A | 1" Ceramic Tile and Grout - Grey<br>08 - Building D, 01 - Boys Restroom, East side near urinals |
| PJ87201-52A | 4" Ceramic Tile & Grout - White w/Green<br>08 - Building D, 04 - Girls Restroom, East side near door at damaged tile |
| PJ87201-54A | Linoleum & Mastic - Mauve Pebble<br>08 - Building D, 05 - Classroom 51, South side of wet area |
| PJ87201-55A | Tackboard - Grey<br>11 - Building K, 01 - Classroom 63, NE corner |
| PJ87201-56A | Tackboard - White<br>13 - Building H, 01 - Classroom 71, NW corner |
| PJ87201-56B | Tackboard - White<br>14 - Building J, 01 - Classroom 72, SE Corner |
| PJ87201-57A | 4" Baseboard and Mastic - Tan<br>14 - Building J, 01 - Classroom 72, South wall west end |
| PJ87201-58A | Stucco<br>01 - Building A, 11 - Exterior, East side center |

**Submitted By:** Chris Chipponeri **Date Submitted:** 07/18/25 **Submitted Via:** FedEX

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| **Job ID:** | Hanford Elementary School District | **Project ID / Job No:** | PJ87201 |
| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-58B | Stucco<br>02 - Building A1, 10 - Exterior, SE corner |
| PJ87201-58C | Stucco<br>04 - Building B, 09 - Exterior, North side center |
| PJ87201-58D | Stucco<br>06 - Building C, 08 - Exterior, West side center |
| PJ87201-58E | Stucco<br>08 - Building D, 11 - Exterior, West side center |
| PJ87201-58F | Stucco<br>10 - Building E, 08 - Exterior, East side |
| PJ87201-59A | Comp Shingle Roofing - Grey<br>01 - Building A, 11 - Exterior, Field sample - East side north half |
| PJ87201-59B | Comp Shingle Roofing - Grey<br>01 - Building A, 11 - Exterior, At peak center |
| PJ87201-59C | Comp Shingle Roofing - Grey<br>02 - Building A1, 10 - Exterior, Field sample, east side north half |
| PJ87201-59D | Comp Shingle Roofing - Grey<br>02 - Building A1, 10 - Exterior, At edge, east side south half |
| PJ87201-59E | Comp Shingle Roofing - Grey<br>04 - Building B, 09 - Exterior, West side at peak |
| PJ87201-59F | Comp Shingle Roofing - Grey<br>04 - Building B, 09 - Exterior, Field, center south side |
| PJ87201-59G | Comp Shingle Roofing - Grey<br>06 - Building C, 08 - Exterior, Field, north side center |
| PJ87201-59H | Comp Shingle Roofing - Grey<br>06 - Building C, 08 - Exterior, Southeast side at edge |
| PJ87201-59I | Comp Shingle Roofing - Grey<br>08 - Building D, 11 - Exterior, Field sample, west end north half center |
| PJ87201-59J | Comp Shingle Roofing - Grey<br>08 - Building D, 11 - Exterior, At peak east end |
| PJ87201-59K | Comp Shingle Roofing - Grey<br>10 - Building E, 08 - Exterior, Field sample, north side center |
| PJ87201-59L | Comp Shingle Roofing - Grey<br>10 - Building E, 08 - Exterior, At peak east end |

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| **Job Site:** | James Monroe Elementary School | **Bill to:** | Forensic Analytical Consulting Services, Inc. |
| **Site Address:** | 300 Monroe Drive, Hanford, CA | | |

| Sample ID | Material Description / Location |
|---|---|
| PJ87201-60A | Pressed Wood Panel<br>01 - Building A, 07 - Classroom 12, East side center |
| PJ87201-60B | Pressed Wood Panel<br>02 - Building A1, 06 - Classroom 21, East side |
| PJ87201-61A | White Window Patch Sealant<br>01 - Building A, 11 - Exterior, At room 11 south side |
| PJ87201-61B | White Window Patch Sealant<br>04 - Building B, 09 - Exterior, At south window room 34 |
| HMS-PJ87201-62A | Window Putty<br>01 - Building A, 11 - Exterior, South side of Rm 11 |
| PJ87201-62B | Window Putty<br>02 - Building A1, 10 - Exterior, North side of room 21 |
| PJ87201-63A | Grey Penetration Mastic<br>01 - Building A, 11 - Exterior, Center at exhaust vent |
| PJ87201-64A | White HVAC Sealant<br>01 - Building A, 11 - Exterior, At east HVAC platform base. |
| PJ87201-64B | White HVAC Sealant<br>06 - Building C, 08 - Exterior, At SE pipe exhaust |
| PJ87201-65A | Door Frame Sealant - Blds A & A1<br>01 - Building A, 11 - Exterior, At north door from Room 12 |
| PJ87201-66A | Vinyl Baseboard Tile and Mastic<br>02 - Building A1, 02 - Custodial Closet, At south wall |
| PJ87201-67A | Grey Pebble HVAC Sealant<br>02 - Building A1, 10 - Exterior, At east unit penetration |
| PJ87201-68A | Door / Window Frame System Sealant<br>02 - Building A1, 10 - Exterior, North side |
| PJ87201-69A | Black Bolt Grommet<br>03 - Building T, 02 - Exterior, Center |
| PJ87201-70A | Black Patch Mastic<br>04 - Building B, 09 - Exterior, West side at exhaust |
| PJ87201-70B | Black Patch Mastic<br>06 - Building C, 08 - Exterior, East HVAC unit |
| PJ87201-71A | Door Frame Sealant - Blds B-E<br>04 - Building B, 09 - Exterior, Room 34 south door |

**Submitted By:** Chris Chipponeri **Date Submitted:** 07/18/25 **Submitted Via:** FedEx

**Received By:** [signature] **Date Received:** 7/21/25 **Received Via:** 10Fx

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| Sample ID | Material Description / Location |
|---|---|
| PJ87201-71B | Door Frame Sealant - Blds B-E<br>08 - Building D, 11 - Exterior, At room 51 |
| PJ87201-72A | Light Grey Window Patch Putty<br>04 - Building B, 09 - Exterior, At girls restroom south side |
| PJ87201-73A | Bolt Mastic<br>05 - Building S, 02 - Exterior, NW side of roof |
| PJ87201-73B | Bolt Mastic<br>07 - Building R, 02 - Exterior, SW side of roof |
| PJ87201-73C | Bolt Mastic<br>09 - Building Q, 02 - Exterior, Center of roof |
| PJ87201-74A | Aluminum Windows Putty<br>04 - Building B, 09 - Exterior, Room 31 south side |
| PJ87201-74B | Aluminum Windows Putty<br>06 - Building C, 08 - Exterior, Room 42 south side |
| PJ87201-75A | Siding Sealant<br>07 - Building R, 02 - Exterior, SW side of portable |
| PJ87201-76A | Grey Ramp Coating<br>07 - Building R, 02 - Exterior, At landing, damaged area |
| PJ87201-77A | Linoleum & Mastic - Large Tan Pebble<br>08 - Building D, 05 - Classroom 51, Under sink at cabinet |
| PJ87201-78A | Foil Tape<br>08 - Building D, 10 - Heater Closet West, West unit, north side |
| PJ87201-79A | Thin White Window Putty<br>08 - Building D, 11 - Exterior, Room 53 north side |
| PJ87201-79B | Thin White Window Putty<br>10 - Building E, 08 - Exterior, At room 62 north side |
| PJ87201-80A | Window Frame Sealant<br>08 - Building D, 11 - Exterior, At room 51 north side |
| PJ87201-81A | Light Grey Penetration Sealant<br>08 - Building D, 11 - Exterior, At west pipe penetration |
| PJ87201-82A | Storefront System Sealant<br>10 - Building E, 08 - Exterior, At girls restroom |
| PJ87201-83A | Window Trim Glue<br>10 - Building E, 08 - Exterior, West end of north side of windows. |

**Submitted By:** Chr Chip **Date Submitted:** 07/18/25 **Submitted Via:** FedEx

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| Sample ID | Material Description / Location |
|---|---|
| PJ87201-83B | Window Trim Glue<br>08 - Building D, 11 - Exterior, At room 54 north side |
| PJ87201-84A | Portable Conjoining Sealant<br>11 - Building K, 02 - Exterior, South side |
| PJ87201-85A | Single-Ply Roofing<br>11 - Building K, 02 - Exterior, Center |
| PJ87201-85B | Single-Ply Roofing<br>11 - Building K, 02 - Exterior, North side, east end |
| PJ87201-86A | Portable Trim Sealant<br>11 - Building K, 02 - Exterior, North side sealant |
| PJ87201-87A | Textured Wood Siding<br>13 - Building H, 02 - Exterior, NE Side |
| PJ87201-87B | Textured Wood Siding<br>14 - Building J, 02 - Exterior, SE side |
| HMS-PJ87201-87C | Textured Wood Siding<br>14 - Building J, 02 - Exterior, SW corner |
| PJ87201-88A | Storefront System Sealant - Portables<br>13 - Building H, 02 - Exterior, At south side center |
| PJ87201-89A | Metal with White Sealant<br>14 - Building J, 02 - Exterior, East side edge |
| PJ87201-89B | Metal with White Sealant<br>14 - Building J, 02 - Exterior, West side edge |
| PJ87201-90A | Texture Siding Sealant<br>14 - Building J, 02 - Exterior, SW corner |
| PJ87201-91A | Storefront System Window Putty<br>14 - Building J, 02 - Exterior, At south windows |
| PJ87201-92A | Portable Siding Sealant<br>15 - Building M, 02 - Exterior, SE corner |
| PJ87201-92B | Portable Siding Sealant<br>16 - Building N, 02 - Exterior, NE corner |
| PJ87201-93A | Valve Gasket - Green<br>17 - Service Yard, Service Yard, SE valve |
| PJ87201-94A | Valve Gasket - Black<br>17 - Service Yard, Service Yard, Northeast valve |

**Submitted By:** [signature] **Date Submitted:** 07/18/25 **Submitted Via:** FedEx

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# Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)
NVLAP Lab Code: 101459-0

FACS - Fresno
Chris Chipponeri
2440 West Shaw Avenue, #105

Fresno, CA 93711

**Client ID:** FR09
**Report Number:** B374166
**Date Received:** 07/21/25
**Date Analyzed:** 07/28/25
**Date Printed:** 07/28/25
**First Reported:** 07/28/25

**Job ID/Site:** PJ87201; Hanford Elementary School District 21228 Cabot Blvd., Hayward, CA 94545
**Date(s) Collected:** 07/18/2025

**SGSFL Job ID:** FR09
**Total Samples Submitted:** 169
**Total Samples Analyzed:** 169

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-1A** | 12817177 | | | | | | |
| Layer: Black Carpet | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Tan Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-2A** | 12817178 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Layer: Beige Mastic | | | **ND** | | | | |
| Layer: Brown Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-2B** | 12817179 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Layer: Beige Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-2C** | 12817180 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Layer: Beige Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-3A** | 12817181 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: White Skimcoat/Joint Compound | | Chrysotile | **Trace** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: This comment applies to White Skimcoat/Joint Compound only - Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-3B** | 12817182 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %) | | | | | | | |

**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-4A** | 12817183 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (35 %) Fibrous Glass (45 %) | | | | | | | |
| **PJ87201-4B** | 12817184 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (35 %) Fibrous Glass (45 %) | | | | | | | |
| **PJ87201-4C** | 12817185 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (35 %) Fibrous Glass (45 %) | | | | | | | |
| **PJ87201-4D** | 12817186 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (35 %) Fibrous Glass (45 %) | | | | | | | |
| **PJ87201-5A** | 12817187 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-5B** | 12817188 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-6A** | 12817189 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Tan Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-6B** | 12817190 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Tan Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |



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**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-7A** | 12817191 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Tan Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| **PJ87201-7B** | 12817192 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Tan Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| **PJ87201-8A** | 12817193 | | | | | | |
| Layer: White Plaster | | | **ND** | | | | |
| Layer: Off-White Non-Fibrous Material | | Chrysotile | **Trace** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| Comment: This comment applies to Off-White Non-Fibrous Material only - Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-8B** | 12817194 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| **PJ87201-9A** | 12817195 | | | | | | |
| Layer: Black Carpet | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-9B** | 12817196 | | | | | | |
| Layer: Black Carpet | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-10A** | 12817197 | | | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (15 %) | | | | | | | |
| **PJ87201-10B** | 12817198 | | | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (15 %) | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-11A** | 12817199 | | | | | | |
| Layer: Grey Sheet Flooring | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Black Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (3 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-11B** | 12817200 | | | | | | |
| Layer: Grey Sheet Flooring | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Black Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (3 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-11C** | 12817201 | | | | | | |
| Layer: Grey Sheet Flooring | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (3 %) | | | | | | | |
| **PJ87201-12A** | 12817202 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-12B** | 12817203 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Mastic | | | **ND** | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (10 %) | | | | | | | |
| **PJ87201-13A** | 12817204 | | | | | | |
| Layer: Off-White Plaster | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (5 %) | | | | | | | |
| **PJ87201-13B** | 12817205 | | | | | | |
| Layer: Off-White Plaster | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (5 %) | | | | | | | |



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**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-13C** | 12817206 | | | | | | |
| Layer: Off-White Plaster | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (5 %) | | | | | | | |
| **PJ87201-13D** | 12817207 | | | | | | |
| Layer: Grey Plaster | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-13E** | 12817208 | | | | | | |
| Layer: Grey Plaster | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-14A** | 12817209 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-14B** | 12817210 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-15A** | 12817211 | | | | | | |
| Layer: White Tile | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Black Mastic | | Chrysotile | **Trace** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| Comment: This comment applies to Black Mastic only - Insufficient material for additional analyses. Bulk complex sample. | | | | | | | |
| **PJ87201-15B** | 12817212 | | | | | | |
| Layer: White Tile | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-16A** | 12817213 | | | | | | |
| Layer: Brown Non-Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Mastic | | | **ND** | | | | |
| Layer: Black Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-16B** | 12817214 | | | | | | |
| Layer: Brown Non-Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Mastic | | | **ND** | | | | |
| Layer: Brown Mastic | | | **ND** | | | | |
| Layer: Off-White Non-Fibrous Material | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-17A** | 12817215 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| **PJ87201-17B** | 12817216 | | | | | | |
| Layer: Off-White Plaster | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (5 %) | | | | | | | |
| **PJ87201-18A** | 12817217 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-19A** | 12817218 | | | | | | |
| Layer: Brown Cementitious Material | | | **ND** | | | | |
| Layer: Off-White Cementitious Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-20A** | 12817219 | | | | | | |
| Layer: Grey Ceramic Tile | | | **ND** | | | | |
| Layer: Off-White Grout | | | **ND** | | | | |
| Layer: Off-White Cementitious Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-21A** | 12817220 | | | | | | |
| Layer: Off-White Plaster | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-21B** | 12817221 | | | | | | |
| Layer: Off-White Plaster | | | **ND** | | | | |
| Layer: White Plaster | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-22A** | 12817222 | | | | | | |
| Layer: White Grout | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-23A** | 12817223 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-23B** | 12817224 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-24A** | 12817225 | | | | | | |
| Layer: Beige Sheet Flooring | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) | | | | | | | |
| **PJ87201-25A** | 12817226 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-26A** | 12817227 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-26B** | 12817228 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-26C** | 12817229 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-27A** | 12817230 | | | | | | |
| Layer: Black Mastic | | Chrysotile | **7 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-28A** | 12817231 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-28B** | 12817232 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-29A** | 12817233 | | | | | | |
| Layer: Blue Non-Fibrous Material | | | **ND** | | | | |
| Layer: White Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-29B** | 12817234 | | | | | | |
| Layer: Blue Non-Fibrous Material | | | **ND** | | | | |
| Layer: White Mastic | | | **ND** | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (10 %) | | | | | | | |
| **PJ87201-30A** | 12817235 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: Green Mastic | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Clear Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (60 %) Comment: Bulk complex sample. | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-30B** | 12817236 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (90 %) | | | | | | | |
| **PJ87201-30C** | 12817237 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: Green Mastic | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Clear Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (60 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-30D** | 12817238 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: Green Mastic | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Clear Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (60 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-31A** | 12817239 | | | | | | |
| Layer: Yellow Fibrous Tile | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (2 %) Fibrous Glass (90 %) | | | | | | | |
| **PJ87201-31B** | 12817240 | | | | | | |
| Layer: Yellow Fibrous Tile | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (2 %) Fibrous Glass (90 %) | | | | | | | |
| **PJ87201-32A** | 12817241 | | | | | | |
| Layer: Off-White Cementitious Material | | | **ND** | | | | |
| Layer: Off-White Grout | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |



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**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-33A** | 12817242 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Off-White Skimcoat/Joint Compound | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| Comment: This comment applies to Off-White Skimcoat/Joint Compound only - Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-33B** | 12817243 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Off-White Skimcoat/Joint Compound | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| Comment: This comment applies to Off-White Skimcoat/Joint Compound only - Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-34A** | 12817244 | | | | | | |
| Layer: Brown Non-Fibrous Material | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Brown Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) | | | | | | | |
| **PJ87201-35A** | 12817245 | | | | | | |
| Layer: Grey Carpet | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Wood | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (10 %) Synthetic (85 %) | | | | | | | |
| **PJ87201-35B** | 12817246 | | | | | | |
| Layer: Grey Carpet | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Wood | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (10 %) Synthetic (85 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-36A** | 12817247 | | | | | | |
| Layer: Beige Sheet Flooring | | | **ND** | | | | |
| Layer: Black/Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-37A** | 12817248 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: White Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |

**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-38A** | 12817249 | | | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) | | | | | | | |
| **PJ87201-38B** | 12817250 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-39A** | 12817251 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-40A** | 12817252 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-40B** | 12817253 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-40C** | 12817254 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-40D** | 12817255 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-40E** | 12817256 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |

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**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-40F** | 12817257 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-40G** | 12817258 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-41A** | 12817259 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (5 %) | | | | | | | |
| **PJ87201-42A** | 12817260 | | | | | | |
| Layer: Blue Tile | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-43A** | 12817261 | | | | | | |
| Layer: White Semi-Fibrous Material | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Fibrous Glass (30 %) | | | | | | | |
| **PJ87201-44A** | 12817262 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (35 %) Fibrous Glass (45 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-45A** | 12817263 | | | | | | |
| Layer: Tan Sheet Flooring | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Black Mastic | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) Comment: This comment is for Black Mastic only - Insufficient material for additional analyses. Bulk complex sample. | | | | | | | |



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**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-45B** | 12817264 | | | | | | |
| Layer: Tan Sheet Flooring | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) | | | | | | | |
| **PJ87201-46A** | 12817265 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-46B** | 12817266 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-47A** | 12817267 | | | | | | |
| Layer: Tan Sheet Flooring | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Yellow Mastic | | | **ND** | | | | |
| Layer: Black Mastic | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) | | | | | | | |
| Comment: This comment is for Black Mastic only - Insufficient material for additional analyses. Bulk complex sample. | | | | | | | |
| **PJ87201-48A** | 12817268 | | | | | | |
| Layer: Multicolored Carpet | | | **ND** | | | | |
| Layer: Off-White Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) Synthetic (85 %) | | | | | | | |
| **PJ87201-49A** | 12817269 | | | | | | |
| Layer: Brown Non-Fibrous Material | | | **ND** | | | | |
| Layer: Beige Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-51A** | 12817270 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Layer: Brown Grout | | | **ND** | | | | |
| Layer: Off-White Cementitious Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-52A** | 12817271 | | | | | | |
| Layer: White Ceramic Tile | | | **ND** | | | | |
| Layer: Off-White Grout | | | **ND** | | | | |
| Layer: Grey Mortar | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-54A** | 12817272 | | | | | | |
| Layer: Multicolored Sheet Flooring | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) | | | | | | | |
| **PJ87201-55A** | 12817273 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-56A** | 12817274 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: White Drywall | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-56B** | 12817275 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Layer: Off-White Wallcovering | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (95 %) | | | | | | | |
| **PJ87201-57A** | 12817276 | | | | | | |
| Layer: Tan Non-Fibrous Material | | | **ND** | | | | |
| Layer: Beige Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-58A** | 12817277 | | | | | | |
| Layer: Beige Cementitious Material | | | **ND** | | | | |
| Layer: Green Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-58B** | 12817278 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-58C** | 12817279 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-58D** | 12817280 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-58E** | 12817281 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-58F** | 12817282 | | | | | | |
| Layer: Grey Cementitious Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-59A** | 12817283 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59B** | 12817284 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59C** | 12817285 | | | | | | |
| Layer: Tan Wood | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) Comment: Bulk complex sample. | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-59D** | 12817286 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59E** | 12817287 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59F** | 12817288 | | | | | | |
| Layer: Tan Wood | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59G** | 12817289 | | | | | | |
| Layer: Tan Wood | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59H** | 12817290 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59I** | 12817291 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| Comment: Bulk complex sample. | | | | | | | |



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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-59J** | 12817292 | | | | | | |
| Layer: Black Roof Shingle | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) Comment: Bulk complex sample. | | | | | | | |
| **PJ87201-59K** | 12817293 | | | | | | |
| Layer: Tan Wood | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| **PJ87201-59L** | 12817294 | | | | | | |
| Layer: Tan Wood | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| **PJ87201-60A** | 12817295 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (100 %) | | | | | | | |
| **PJ87201-60B** | 12817296 | | | | | | |
| Layer: Tan Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (100 %) | | | | | | | |
| **PJ87201-61A** | 12817297 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Tan Non-Fibrous Material | | Chrysotile | **Trace** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-61B** | 12817298 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **HMS-PJ87201-62A** | 12817299 | | | | | | |
| Layer: Tan Putty | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-62B** | 12817300 | | | | | | |
| Layer: Tan Putty | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |

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| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-63A** | 12817301 | | | | | | |
| Layer: Grey Mastic | | Chrysotile | **3 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-64A** | 12817302 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-64B** | 12817303 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-65A** | 12817304 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-66A** | 12817305 | | | | | | |
| Layer: Tan Tile | | Chrysotile | **2 %** | | | | |
| Layer: Black Mastic | | Chrysotile | **2 %** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-67A** | 12817306 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-68A** | 12817307 | | | | | | |
| Layer: Tan Non-Fibrous Material | | Chrysotile | **Trace** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Comment: This comment applies only to the Tan Non-Fibrous Material; Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-69A** | 12817308 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-70A** | 12817309 | | | | | | |
| Layer: Black Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (10 %) | | | | | | | |

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-70B** | 12817310 | | | | | | |
| Layer: Black Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (10 %) | | | | | | | |
| **PJ87201-71A** | 12817311 | | | | | | |
| Layer: Tan Non-Fibrous Material | | Chrysotile | **Trace** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Comment: This comment applies only to Tan Non-Fibrous Material; Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-71B** | 12817312 | | | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Tan Non-Fibrous Material | | Chrysotile | **Trace** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Comment: This comment applies only to Tan Non-Fibrous Material; Insufficient material for additional analyses. | | | | | | | |
| **PJ87201-72A** | 12817313 | | | | | | |
| Layer: Grey Putty | | Chrysotile | **2 %** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-73A** | 12817314 | | | | | | |
| Layer: Grey Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (2 %) | | | | | | | |
| **PJ87201-73B** | 12817315 | | | | | | |
| Layer: Grey Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (2 %) | | | | | | | |
| **PJ87201-73C** | 12817316 | | | | | | |
| Layer: Grey Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (2 %) | | | | | | | |
| **PJ87201-74A** | 12817317 | | | | | | |
| Layer: Grey Putty | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-74B** | 12817318 | | | | | | |
| Layer: Grey Putty | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |



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**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-75A** | 12817319 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-76A** | 12817320 | | | | | | |
| Layer: Grey Coating | | | **ND** | | | | |
| Layer: Stones | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Fibrous Glass (3 %) | | | | | | | |
| **PJ87201-77A** | 12817321 | | | | | | |
| Layer: Beige Sheet Flooring | | | **ND** | | | | |
| Layer: Fibrous Backing | | | **ND** | | | | |
| Layer: Grey Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (20 %) Fibrous Glass (5 %) Synthetic (10 %) | | | | | | | |
| **PJ87201-78A** | 12817322 | | | | | | |
| Layer: Foil | | | **ND** | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-79A** | 12817323 | | | | | | |
| Layer: Grey Putty | | Chrysotile | **Trace** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-79B** | 12817324 | | | | | | |
| Layer: Grey Putty | | Chrysotile | **Trace** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-80A** | 12817325 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-81A** | 12817326 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-82A** | 12817327 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |



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**Report Number:** B374166
**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-83A** | 12817328 | | | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-83B** | 12817329 | | | | | | |
| Layer: Tan Mastic | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-84A** | 12817330 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (Trace) | | | | | | | |
| **PJ87201-85A** | 12817331 | | | | | | |
| Layer: Stones | | | **ND** | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (40 %) Fibrous Glass (35 %) | | | | | | | |
| **PJ87201-85B** | 12817332 | | | | | | |
| Layer: Tan Wood | | | **ND** | | | | |
| Layer: Black Tar | | | **ND** | | | | |
| Layer: Black Felt | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) | | | | | | | |
| **PJ87201-86A** | 12817333 | | | | | | |
| Layer: Grey Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-87A** | 12817334 | | | | | | |
| Layer: Paint | | | **ND** | | | | |
| Layer: Beige Coating | | Chrysotile | **2 %** | | | | |
| Layer: Wood | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-87B** | 12817335 | | | | | | |
| Layer: Paint | | | **ND** | | | | |
| Layer: Beige Coating | | Chrysotile | **2 %** | | | | |
| Layer: Wood | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |

**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **HMS-PJ87201-87C** | 12817336 | | | | | | |
| Layer: Paint | | | **ND** | | | | |
| Layer: Beige Coating | | Chrysotile | **2 %** | | | | |
| Layer: Wood | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-88A** | 12817337 | | | | | | |
| Layer: Grey Non-Fibrous Material | | Chrysotile | **2 %** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-89A** | 12817338 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-89B** | 12817339 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Layer: White Non-Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-90A** | 12817340 | | | | | | |
| Layer: Paint | | | **ND** | | | | |
| Layer: Beige Non-Fibrous Material | | Chrysotile | **2 %** | | | | |
| Layer: Silver Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-91A** | 12817341 | | | | | | |
| Layer: Brown Putty | | Chrysotile | **3 %** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-92A** | 12817342 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| **PJ87201-92B** | 12817343 | | | | | | |
| Layer: Off-White Non-Fibrous Material | | | **ND** | | | | |
| Layer: Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |

**Report Number:** B374166

**Client Name:** FACS - Fresno **Date Printed:** 07/28/25

| Sample ID | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|---|---|---|---|---|---|---|---|
| **PJ87201-93A** | 12817344 | | | | | | |
| Layer: Green Fibrous Material | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |
| Cellulose (85 %) Fibrous Glass (15 %) | | | | | | | |
| **PJ87201-94A** | 12817345 | | | | | | |
| Layer: Black Non-Fibrous Material | | | **ND** | | | | |
| Layer: Silver Paint | | | **ND** | | | | |
| Total Percentage Values of Non-Asbestos Fibrous Components: | | | | | | | |



Maria Cosper, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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# Appendix B

## Lead Paint Chip Summary, Sample Chain-of-Custody, Laboratory Results Report, XRF Testing Data and CDPH 8552 Form

| Lead Paint Chip Summary (Lab Report #M270688)<br>Hanford ESD – Monroe ES – Modernization HBM Survey<br>Survey Date: July 16-18, 2025 | | | | | |
|---|---|---|---|---|---|
| **Sample Number** | **Component Location** | **Component** | **Color** | **Substrate** | **Analytical Results (weight percent of lead)** |
| 01Pb | Room 55 – Building Q | Window Trim | White | Wood | <0.009 |
| 02Pb | Room 21 - Building A1 | Door Frame | Green | Metal | <0.006 |
| 03Pb | Room 11 - Building A | Door | Green | Metal | <0.007 |
| **04Pb** | **Exterior - Building A1** | **Wall** | **Grey** | **Stucco** | **0.050** |
| 05Pb | Room 45 - Building R | Ramp Coating | Grey | Metal | <0.006 |
| 06Pb | Room 55 - Building Q | Door | Green/Brown | Metal | <0.009 |
| 07Pb | Room 35 - Building S | Handrail | Green | Metal | <0.01 |
| 08Pb | Room 25 - Building T | Siding | Grey | Wood | <0.007 |
| 09Pb | Roof - Building E | Flashing | Green | Metal | <0.007 |
| 10Pb | Room 64 - Building L | Door Frame | Green/Brown | Metal | <0.006 |
| 11Pb | Room 74 - Building M | Framing | Grey | Metal | <0.006 |
| 12Pb | Room 75 - Building N | Trim | Green | Wood | <0.006 |
| 13Pb | Room 25 - Building T | Trim | Green | Wood | <0.006 |

**SGS** FORENSIC LABORATORIES

# Analysis Request Form (COC)

| | |
|---|---|
| Client Name & Address: FACS Modesto<br>313 Banner Court, Suite B<br>Modesto, CA 95356 | Client No.: MOD08 |
| PO / Job#: PJ87201 | Date: 07/18/25 |
| Turn Around Time: Same Day / 1Day / 2Day / 3Day / 4Day / 5Day | |
| ☐ PCM: ☐ NIOSH 7400A / ☐ NIOSH 7400B ☐ Rotometer | |
| ☐ PLM: ☐ Standard / ☐ Point Count 400 - 1000 / ☐ CARB 435 | |
| Contact: Chris Chipponeri | Phone: (209) 484-4648 |
| E-mail: chris.c@facs.com | ☐ TEM Air: ☐ AHERA / ☐ Yamate2 / ☐ NIOSH 7402<br>☐ TEM Bulk: ☐ Quantitative / ☐ Qualitative / ☐ Chatfield<br>☐ TEM Water: ☐ Potable / ☐ Non-Potable / ☐ Weight %<br>☐ TEM Microvac: ☐ Qual / ☐ D5755(str/area) / ☐ D5756(str/mass) |
| Site Name: Monroe Elementary School | ☐ IAQ Particle Identification (PLM LAB) ☐ PLM Opaques/Soot<br>☐ Particle Identification (TEM LAB) ☐ Special Project |
| Site Location: 300 Monroe Drive, Hanford, CA 93230 | ☒ Metals Analysis Matrix: Paint Chip Method: Flame AA<br>Analytes: Lead |
| Comments: Pg 1 of 2 | ☐ Silica in Air ☐ w/Gravimetry<br>☐ Quartz Only |

| Sample ID | Date / Time | Sample Location / Description | FOR AIR SAMPLES ONLY | | | | Sample Area / Air Volume |
|---|---|---|---|---|---|---|---|
| | | | Type | Time On/Off | Avg ~~LPM~~ | ~~Total~~ Time | |
| PJ87201-01Pb | 07/18/25 | White paint on wood window trim - Room 55 - Building Q - S Window | A P C | | | | |
| PJ87201-02Pb | 07/18/25 | Green paint on metal door frame - Room 21 - Building A1 - South Doorway | A P C | | | | |
| PJ87201-03Pb | 07/18/25 | Green paint on metal door - Room 11 - Building A - North Door | A P C | | | | |
| PJ87201-04Pb | 07/18/25 | Grey paint on stucco wall - Exterior - Building A1 - SW Corner | A P C | | | | |
| PJ87201-05Pb | 07/18/25 | Grey ramp coating - Room 45 - Building R - At Landing Damage | A P C | | | | |
| PJ87201-06Pb | 07/18/25 | Green / Brown paint on metal door - Room 55 - Building Q - South Side | A P C | | | | |
| PJ87201-07Pb | 07/18/25 | Green paint on metal handrail - Room 35 - Building S - West End of Railing | A P C | | | | |
| PJ87201-08Pb | 07/18/25 | Grey paint on wood siding - Room 25 - Building T - West Side Center | A P C | | | | |
| PJ87201-09Pb | 07/18/25 | Green paint on metal flashing - Roof - Building E - East Side, South Half | A P C | | | | |
| PJ87201-10Pb | 07/18/25 | Green-Brown paint on metal door frame - Room 64 - Building L | A P C | | | | |

Sampled By: Chris C Date/Time: 07/18/25 Shipped Via: ☐ Fed Ex ☐ UPS ☐ US Mail ☐ Courier ☐ Drop Off ☐ Other:

| | | |
|---|---|---|
| Relinquished By: [signature]<br>Date / Time: 07/18/25 1620 | Relinquished By:<br>Date / Time: | Relinquished By:<br>Date / Time: |
| Received By: MC<br>Date / Time: 7/21/25 1040<br>Condition Acceptable? ☐ Yes ☐ No | Received By:<br>Date / Time:<br>Condition Acceptable? ☐ Yes ☐ No | Received By:<br>Date / Time:<br>Condition Acceptable? ☐ Yes ☐ No |

**SGS** FORENSIC LABORATORIES

# Analysis Request Form (COC)

| | |
|---|---|
| Client Name & Address: FACS Modesto<br>313 Banner Court, Suite B<br>Modesto, CA 95356 | Client No.: MOD08 |
| PO / Job#: PJ87201 | Date: 07/18/25 |
| Turn Around Time: Same Day / 1Day / 2Day / 3Day / 4Day / 5Day | |
| ☐ PCM: ☐ NIOSH 7400A / ☐ NIOSH 7400B ☐ Rotometer | |
| ☐ PLM: ☐ Standard / ☐ Point Count 400 - 1000 / ☐ CARB 435 | |
| Contact: Chris Chipponeri | Phone: (209) 484-4648 |
| ☐ TEM Air: ☐ AHERA / ☐ Yamate2 / ☐ NIOSH 7402<br>☐ TEM Bulk: ☐ Quantitative / ☐ Qualitative / ☐ Chatfield<br>☐ TEM Water: ☐ Potable / ☐ Non-Potable / ☐ Weight %<br>☐ TEM Microvac: ☐ Qual / ☐ D5755(str/area) / ☐ D5756(str/mass) | |
| E-mail: chris.c@facs.com | |
| Site Name: Monroe Elementary School | ☐ IAQ Particle Identification (PLM LAB) ☐ PLM Opaques/Soot<br>☐ Particle Identification (TEM LAB) ☐ Special Project |
| Site Location: 300 Monroe Drive, Hanford, CA 93230 | ☒ Metals Analysis Matrix: Paint Chip Method: Flame AA<br>Analytes: Lead |
| Comments: Pg 2 of 2 | ☐ Silica in Air ☐ w/Gravimetry<br>☐ Quartz Only |

| Sample ID | Date / Time | Sample Location / Description | FOR AIR SAMPLES ONLY: Type | Time On/Off | Avg ~~LPM~~ | ~~Total Time~~ | Sample Area / Air Volume |
|---|---|---|---|---|---|---|---|
| PJ87201-11Pb | 07/18/25 | Grey paint on metal framing - Room 74 - Building M - SE Corner | A P C | | | | |
| PJ87201-12Pb | 07/18/25 | Green paint on wood trim - Room 75 - Building N - Door Frame at Damage | A P C | | | | |
| PJ87201-13Pb | 07/18/25 | Green paint on wood trim - Room 25 - Building T - Window trim South Side | A P C | | | | |
| | | | A P C | | | | |
| | | | A P C | | | | |
| | | | A P C | | | | |
| | | | A P C | | | | |
| | | | A P C | | | | |
| | | | A P C | | | | |
| | | | A P C | | | | |

Sampled By: Chris C Date/Time: 07/18/25 Shipped Via: ☐ Fed Ex ☐ UPS ☐ US Mail ☐ Courier ☐ Drop Off ☐ Other:

| Relinquished By: | Relinquished By: | Relinquished By: |
|---|---|---|
| Date / Time: 07/18/25 1620 | Date / Time: | Date / Time: |
| Received By: | Received By: | Received By: |
| Date / Time: 7/21/25 0740 | Date / Time: | Date / Time: |
| Condition Acceptable? ☐ Yes ☐ No | Condition Acceptable? ☐ Yes ☐ No | Condition Acceptable? ☐ Yes ☐ No |

# Metals Analysis of Paints

(AIHA-LAP, LLC Accreditation, Lab ID #101762)

FACS - Fresno
Chris Chipponeri
2440 West Shaw Avenue, #105

Fresno, CA 93711

**Client ID:** FR09
**Report Number:** M270688
**Date Received:** 07/21/25
**Date Analyzed:** 07/28/25
**Date Printed:** 07/28/25
**First Reported:** 07/28/25

**Job ID / Site:** PJ87201; Hanford Elementary School District 21228 Cabot Blvd., Hayward, CA 94545
**SGSFL Job ID:** FR09

**Date(s) Collected:** 7/18/25
**Total Samples Submitted:** 13
**Total Samples Analyzed:** 13

| Sample Number | Lab Number | Analyte | Result | Result Units | Reporting Limit* | Method Reference |
|---|---|---|---|---|---|---|
| PJ87201-01PB | 30957893 | Pb | < 0.009 | wt% | 0.009 | EPA 3050B/7000B |
| PJ87201-02PB | 30957894 | Pb | < 0.006 | wt% | 0.006 | EPA 3050B/7000B |
| PJ87201-03PB | 30957895 | Pb | < 0.007 | wt% | 0.007 | EPA 3050B/7000B |
| PJ87201-04PB | 30957896 | Pb | 0.050 | wt% | 0.006 | EPA 3050B/7000B |
| PJ87201-05PB | 30957897 | Pb | < 0.006 | wt% | 0.006 | EPA 3050B/7000B |
| PJ87201-06PB | 30957898 | Pb | < 0.009 | wt% | 0.009 | EPA 3050B/7000B |
| PJ87201-07PB | 30957899 | Pb | < 0.01 | wt% | 0.01 | EPA 3050B/7000B |
| PJ87201-08PB | 30957900 | Pb | < 0.007 | wt% | 0.007 | EPA 3050B/7000B |
| PJ87201-09PB | 30957901 | Pb | < 0.007 | wt% | 0.007 | EPA 3050B/7000B |
| PJ87201-10PB | 30957902 | Pb | < 0.006 | wt% | 0.006 | EPA 3050B/7000B |
| PJ87201-11PB | 30957903 | Pb | < 0.006 | wt% | 0.006 | EPA 3050B/7000B |
| PJ87201-12PB | 30957904 | Pb | < 0.006 | wt% | 0.006 | EPA 3050B/7000B |
| PJ87201-13PB | 30957905 | Pb | < 0.006 | wt% | 0.006 | EPA 3050B/7000B |

* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Kevin Poon

Kevin Poon, Laboratory Supervisor, Hayward Laboratory

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Note* Sampling data used in this report was provided by the client as noted on the associated chain of custody form.

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# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
| **Start Time:** | 1045 | **Calibration:** | **1.03 =** | 1.03 | **1.03 =** | 1.06 | **1.03 =** | 1.06 | **Technician:** | Ethan McLaughlin |
| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result ($mg/cm^2$) |
|---|---|---|---|---|---|---|
| 1. | Building A | Grey | Stucco | Wall | I | 0 |
| 2. | | Green | Metal | Doorframe | I | 0 |
| 3. | | Green | Metal | Door | I | 0 |
| 4. | | Red | Concrete | Door swing | I | 0.55 |
| 5. | | Green | Wood | Bench | I | 0.2 |
| 6. | | Green | Metal | Window frame | I | 0.92 |
| 7. | | Green | Metal | Window | I | 0.7 |
| 8. | | Green | Wood | Window Trim | I | 1.09 |
| 9. | | Grey | Metal | Electrical Pad | I | 0 |
| 10. | | Grey | Metal | Fire Hose Cabinet | I | 0.94 |
| 11. | Room 12 | Beige | Wood | Chair rail | I | 0.01 |
| 12. | | Beige | Wood | Doorframe (RR) | I | 0.01 |
| 13. | | White | Porcelain | Sink | I | 0.01 |
| 14. | | Beige | Wood | Coat Rack | I | 0.04 |
| 15. | | Beige | Wood | Door | I | 0.01 |
| 16. | | White | Porcelain | Toilet | I | 0 |
| 17. | | Tan | Plaster | Wall | I | 0.42 |
| 18. | | Beige | Metal | Door frame | I | 0 |
| 19. | | Beige | Metal | Door | I | 0 |

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# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
| **Start Time:** | 1045 | **Calibration:** | **1.03 =** | 1.03 | **1.03 =** | 1.06 | **1.03 =** | 1.06 | **Technician:** | Ethan McLaughlin |
| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 20. | Room 12 | Beige | Wood | Cabinet | I | 1.03 |
| 21. | | Beige | Wood | Windowsill | I | 0.63 |
| 22. | | Beige | Metal | Window | I | 0.23 |
| 23. | | Beige | Metal | Support pole | I | 2.04 |
| 24. | | Beige | Metal | Door | I | 0.58 |
| 25. | | Beige | Metal | Window frame | I | 0.63 |
| 26. | | White | Wood | Wall | I | 1.53 |
| 27. | | Beige | Metal | Heater cabinet | I | 0.65 |
| 28. | | White | Wood | Wall | I | 0 |
| 29. | | White | Porcelain | Sink (center) | I | 7.07 |
| 30. | | White | Wood | Wall | I | 1.83 |
| 31. | Building A1 | Grey | Stucco | Wall | I | 0 |
| 32. | | Green | Wood | Bench | I | 0.41 |
| 33. | | Green | Metal | Door frame | I | 0 |
| 34. | | Green | Metal | Door | I | 0 |
| 35. | | Brown | Metal | Window | I | 0.72 |
| 36. | | Green | Wood | Window Trim | I | 4.41 |
| 37. | | Green | Wood | Windowsill | I | 5.56 |
| 38. | | Green | Metal | Window Frame | I | 0.86 |
| 39. | | Red | Concrete | Door Swing | I | 0.41 |

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# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
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| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 40. | Building A1 | Grey | Metal | Electrical Panel | I | 0 |
| 41. | | Grey | Metal | Fire Hose Cabinet | I | 1.14 |
| 42. | | green | metal | Guard Rail | I | 0 |
| 43. | | White | Porcelain | Drinking Fountain | I | 0 |
| 44. | Room 21 | Tan | Wood | Canvas Wallpaper | I | 1.46 |
| 45. | | Beige | Metal | Door | I | 0 |
| 46. | | Beige | Metal | Door Frame | I | 0 |
| 47. | | Beige | Wood | Wall Trim | I | 0 |
| 48. | | Beige | Wood | Cabinets | I | 1.07 |
| 49. | | Beige | Wood | Sink Cabinets | I | 0.59 |
| 50. | | White | Porcelain | Sink | I | 7.23 |
| 51. | | Beige | Wood | Windowsill | I | 1.06 |
| 52. | | Beige | Metal | Window Frame | I | 0.6 |
| 53. | | Beige | Metal | Window | I | 0.32 |
| 54. | | Beige | Metal | Door (North) | I | 0.81 |
| 55. | | Tan | Wood | Wall | I | 0.01 |
| 56. | | Beige | Metal | Support Pole | I | 0.41 |
| 57. | | Beige | Wood | Shelving | I | 0.02 |
| 58. | Portable 25 | Green | Metal | Handrail | I | 0 |

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| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result ($mg/cm^2$) |
|---|---|---|---|---|---|---|
| 59. | Portable 25 | Grey | Metal | Ramp Covering | I | 0 |
| 60. | | Grey | Wood | Wall | I | 0 |
| 61. | | Green | Metal | Door | I | 0 |
| 62. | | Green | Metal | Door Frame | I | 0 |
| 63. | | Green | Wood | Door Trim | I | 0 |
| 64. | | Grey | Metal | Downspout | I | 0.02 |
| 65. | Portable 25 Interior | Brown | Metal | Door | I | 0 |
| 66. | | Brown | Metal | Door Frame | I | 0 |
| 67. | Portable 25 | Grey | Metal | Foundation Frame | I | 0 |
| 68. | | Green | Wood | Window frame | I | 0 |
| 69. | Portable 35 | Grey | Metal | Corner Covering | I | 0 |
| 70. | | Grey | Wood | Wall | I | 0 |
| 71. | | Green | Wood | Window Trim | I | 0 |
| 72. | | Green | Metal | Handrail | I | 0 |
| 73. | | Grey | Metal | Ramp Covering | I | 0 |
| 74. | | Green | Wood | Door Trim | I | 0 |
| 75. | | Green | Metal | Door Frame | I | 0 |
| 76. | | Green | Metal | Door | I | 0 |
| 77. | Portable 35 Interior | Brown | Metal | Door | I | 0 |

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| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
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| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 78. | Portable 35 Interior | Brown | Metal | Door Frame | I | 0 |
| 79. | | White | Wood | Window Trim | I | 0 |
| 80. | Building B | Grey | Stucco | Wall | I | 0 |
| 81. | | Green | Metal | Door | I | 0 |
| 82. | | Green | Metal | Door Frame | I | 0.27 |
| 83. | | Grey | Metal | Fire Extinguisher Box | I | 0.98 |
| 84. | | Green | Metal | Support Pole | I | 1.65 |
| 85. | | Green | Metal | Door frame | I | 0.43 |
| 86. | | Green | Metal | Door | I | 0 |
| 87. | | White | Porcelain | Drinking Fountain | I | 0 |
| 88. | | Green | Metal | Guard Rail | I | 0 |
| 89. | Building A1 | Grey | Wood | Wing Wall | I | 0.19 |
| 90. | Service Yard | Red | Metal | Valve | I | 0 |
| 91. | | Grey | Metal | Valve | I | 0 |
| 92. | | Silver | Metal | Tank | I | 0.01 |
| 93. | | Pink | Metal | Cabinet | I | 0.05 |
| 94. | | Silver | Metal | Pipes | I | 0.09 |
| 95. | Building B | Grey | Stucco | Overhang | I | 0 |
| 96. | | Grey | Wood | Overhang Trim | I | 0.71 |

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| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 97. | Building B | Grey | Wood | Overhang Brace | I | 0.43 |
| 98. | | Green | Wood | Fascia | I | 0.59 |
| 99. | Room 31 | Beige | Metal | Door | I | 0 |
| 100. | | Beige | Metal | Door Frame | I | 0.59 |
| 101. | | Tan | Wood | Canvas Wallpaper | I | 0.07 |
| 102. | | Off White | Plaster | Wall | I | 0.69 |
| 103. | | Beige | Wood | Door | I | 0.03 |
| 104. | | Beige | Metal | Door Frame | I | 0.62 |
| 105. | | Yellow | Plaster | Wall | I | 0.14 |
| 106. | | Beige | Wood | Sink Coating | I | 0.69 |
| 107. | | White | Porcelain | Sink | I | 7.71 |
| 108. | | Beige | Wood | Countertop | I | 0.04 |
| 109. | | Beige | Wood | Windowsill | I | 0.72 |
| 110. | | Beige | Wood | Window Trim | I | 0.29 |
| 111. | | Beige | Wood | Window Frame | I | 0.33 |
| 112. | Building B | Green | Metal | Panel | I | 0 |
| 113. | | Green | Metal | Door Frame | I | 0 |
| 114. | Girls Restroom – Building B | Grey | Ceramic | Wall Tile | I | 7.83 |
| 115. | | Grey | Plaster | Wall | I | 0.84 |

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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 116. | Girls Restroom – Building B | White | Porcelain | Sink | I | 7.18 |
| 117. | | White | Porcelain | Toilet | I | 4.82 |
| 118. | | Green | Wood | Counter | I | 0.07 |
| 119. | Boy's Restroom – Building A1 | Grey | Ceramic | Wall Tile | I | 5.89 |
| 120. | | Light Grey | Ceramic | Wall Tile | I | 8.47 |
| 121. | | White | Porcelain | Urinal | I | 0.03 |
| 122. | | White | Plaster | Wall | I | 0.36 |
| 123. | Building C | Grey | Stucco | Wall | I | 0 |
| 124. | | White | Porcelain | Drinking Fountain | I | 0 |
| 125. | | Green | Metal | Support Pole | I | 1.83 |
| 126. | | Grey | Stucco | Overhang | I | 0 |
| 127. | | Grey | Wood | Overhang Trim | I | 0.64 |
| 128. | | Green | Wood | Fascia | I | 0.76 |
| 129. | | Green | Metal | Door | I | 0 |
| 130. | | Green | Metal | Door Frame | I | 0.2 |
| 131. | | Red | Concrete | Door Swing | I | 0.05 |
| 132. | | Grey | Metal | Extinguisher Box | I | 2.03 |
| 133. | Building C – Staff Kitchen | White | Wood | Cabinets | I | 0.13 |
| 134. | | Beige | Metal | Door Frame | I | 0 |

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| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 135. | Building C – Staff Kitchen | Clear | Wood | Door | I | 0 |
| 136. | | Beige | Wood | Cabinet | I | 0.27 |
| 137. | Room 41 | Green | Metal | Door Frame | I | 0.19 |
| 138. | | Green | Metal | Door | I | 0 |
| 139. | | White | Wood | Wall Trim | I | 0.37 |
| 140. | | White | Plaster | Wall | I | 0.21 |
| 141. | | White | Wood | Wall | I | 0.08 |
| 142. | | Beige | Wood | Cabinet | I | 0.55 |
| 143. | | White | Wood | Windowsill | I | 0.49 |
| 144. | | White | Wood | Window Frame | I | 0.54 |
| 145. | | White | Wood | Window Trim | I | 0.42 |
| 146. | Portable 45 | Green | Metal | Handrail | I | 0 |
| 147. | | Green | Wood | Window Trim | I | 0 |
| 148. | | Grey | Metal | Corner Trim | I | 0 |
| 149. | | Grey | Wood | Wall | I | 0 |
| 150. | | Grey | Metal | Ramp Covering | I | 0 |
| 151. | | Green | Wood | Door Trim | I | 0 |

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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 152. | Portable 45 | Green | Metal | Door Frame | I | 0 |
| 153. | | Brown | Metal | Door | I | 0 |
| 154. | Portable 45 Interior | Brown | Metal | Door | I | 0 |
| 155. | | White | Wood | Door Frame | I | 0 |
| 156. | | Grey | Wood | Window Trim | I | 0 |
| 157. | Building C | Grey | Wood | Wing Wall | I | 0.12 |
| 158. | | Grey | Metal | Windowsill | I | 0.75 |
| 159. | | Grey | Stucco | Wall | I | 0 |
| 160. | Portable 55 | Green | Metal | Handrail | I | 0 |
| 161. | | Grey | Metal | Ramp Covering | I | 0 |
| 162. | | Grey | Wood | Wall | I | 0 |
| 163. | | Grey | Metal | Window Trim | I | 0 |
| 164. | | Green | Wood | Windowsill | I | 0 |
| 165. | | Green | Wood | Door Trim | I | 0 |

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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 166. | Portable 55 | Green | Metal | Door Frame | I | 0 |
| 167. | | Green | Metal | Door | I | 0 |
| 168. | Portable 55 Interior | Brown | Metal | Door | I | 0 |
| 169. | | Brown | Metal | Door Frame | I | 0 |
| 170. | | White | Wood | Window Trim | I | 0 |
| 171. | Building D | Red | Concrete | Door Full Circle Swing | I | 1.0 |
| 172. | | Green | Metal | Support Pole | I | 3.47 |
| 173. | | Grey | Stucco | Wall | I | 0.18 |
| 174. | | Green | Metal | Door | I | 0 |
| 175. | | Green | Metal | Door Frame | I | 0.13 |
| 176. | | Grey | Metal | Extinguisher Box | I | 0.71 |
| 177. | | White | Porcelain | Drinking Fountain | I | 0.65 |
| 178. | | Green | Metal | Guard Rail | I | 0.05 |
| 179. | | Grey | Metal | Windowsill | I | 0.08 |

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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 180. | Building D – Women's Restroom | White | Ceramic | Wall Tile | I | 0.01 |
| 181. | | Green | Metal | Storefront | I | 0 |
| 182. | | White | Plaster | Wall | I | 0.08 |
| 183. | | White | Porcelain | Sink | I | 0 |
| 184. | | Green | Metal | Storefront Panel | I | 0 |
| 185. | | Green | Metal | Door | I | 0 |
| 186. | Classroom 51 | Green | Metal | Door | I | 0 |
| 187. | | Beige | Metal | Door Frame | I | 0.06 |
| 188. | | white | Wood | Wall Trim | I | 0.01 |
| 189. | | Beige | Wood | Cabinets | I | 0 |
| 190. | | Beige | Wood | Sink Cabinets | I | 0 |
| 191. | | White | Wood | Wall | I | 0.21 |
| 192. | | White | Wood | Canvas Wallpaper | I | 0.12 |
| 193. | | White | Wood | Windowsill | I | 0.06 |

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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 194. | Classroom 51 | White | Wood | Window Trim | I | 0.16 |
| 195. | | White | Wood | Window Frame | I | 0.57 |
| 196. | Building D | Grey | Wood | Wing Wall | I | 0.26 |
| 197. | | Grey | Metal | Windowsill | I | 0.15 |
| 198. | | Green | Metal | Door (N) | I | 0.13 |
| 199. | | Green | Metal | Door Frame (N) | I | 0.07 |
| 200. | | Grey | Metal | Louver | I | 0.13 |
| 201. | Building E | White | Porcelain | Drinking Fountain | I | 0 |
| 202. | | Green | Metal | Guard Rail | I | 0.05 |
| 203. | | Grey | Stucco | Wall | I | 0.02 |
| 204. | | Grey | Metal | Window Trim | I | 0.15 |
| 205. | | Red | Concrete | Door Swing | I | 0.74 |
| 206. | | Green | Metal | Support Pole | I | 0.06 |
| 207. | | Green | Metal | Door | I | 0 |

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| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 208. | Building E | Green | Metal | Door Frame | I | 0.38 |
| 209. | Building E – Women's Restroom | Green | Metal | Storefront Panel | I | 0 |
| 210. | | White | Ceramic | Wall Tile | I | 0.71 |
| 211. | | Green | Ceramic | Wall Tile | I | 0 |
| 212. | | White | Plaster | Wall | I | 0.09 |
| 213. | | White | Porcelain | Sink | I | 0 |
| 214. | Building E | Grey | Wood | Wing Wall | I | 0.16 |
| 215. | | Green | Metal | Windowsill | I | 0.05 |
| 216. | | Green | Metal | Door | I | 0.39 |
| 217. | | Green | Metal | Door Frame | I | 0.48 |
| 218. | | Grey | Metal | Louver | I | 0.12 |
| 219. | | Grey | Metal | Windowsill | I | 0.18 |
| 220. | Room 62 | Clear | Wood | Cabinet | I | 0 |
| 221. | | Clear | Wood | Wall | I | 0 |

FACS 35
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CELEBRATING 35 YEARS OF EXCELLENCE · 1986–2021

# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
| **Start Time:** | 1045 | **Calibration:** | **1.03 =** | 1.03 | **1.03 =** | 1.06 | **1.03 =** | 1.06 | **Technician:** | Ethan McLaughlin |
| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 222. | Room 62 | White | Wood | Windowsill | I | 0.04 |
| 223. | | White | Wood | Window Trim | I | 1.17 |
| 224. | | White | Wood | Window Frame | I | 0.85 |
| 225. | | Green | Metal | Door | I | 0 |
| 226. | | Green | Metal | Door Frame | I | 0.61 |
| 227. | Portable 63 | Grey | Wood | Wall | I | 0 |
| 228. | | Grey | Metal | Frame | I | 0 |
| 229. | | Green | Wood | Window Trim | I | 0 |
| 230. | | Green | Metal | Handrail | I | 0 |
| 231. | | Grey | Metal | Ramp Covering | I | 0 |
| 232. | | Green | Metal | Door Frame | I | 0 |
| 233. | | Green | Metal | Door | I | 0 |
| 234. | | Green | Metal | Downspout | I | 0 |
| 235. | Portable 63 Interior | White | Metal | Door | I | 0.01 |

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# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
| **Start Time:** | 1045 | **Calibration:** | **1.03 =** | 1.03 | **1.03 =** | 1.06 | **1.03 =** | 1.06 | **Technician:** | Ethan McLaughlin |
| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result ($mg/cm^2$) |
|---|---|---|---|---|---|---|
| 236. | Portable 63 Interior | White | Metal | Door Frame | I | 0.02 |
| 237. | | Grey | Wood | Windowsill | I | 0 |
| 238. | Portable 64 | Grey | Metal | Frame | I | 0 |
| 239. | | Grey | Wood | Wall | I | 0 |
| 240. | | Green | Wood | Window Trim | I | 0 |
| 241. | Portable 64 | Green | Metal | Handrail | I | 0 |
| 242. | | Grey | Metal | Ramp Covering | I | 0 |
| 243. | | Green | Wood | Door Trim | I | 0 |
| 244. | | Green | Metal | Door Frame | I | 0 |
| 245. | | Green | Metal | Door | I | 0 |
| 246. | | Grey | Metal | Downspout | I | 0 |
| 247. | Portable 64 Interior | White | Wood | Window Trim | I | 0 |
| 248. | | Brown | Metal | Door Frame | I | 0 |
| 249. | | Brown | Metal | Door | I | 0 |

FACS 35
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CELEBRATING 35 YEARS OF EXCELLENCE · 1986–2021

# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
| **Start Time:** | 1045 | **Calibration:** | **1.03 =** | 1.03 | **1.03 =** | 1.06 | **1.03 =** | 1.06 | **Technician:** | Ethan McLaughlin |
| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 250. | Portable 75 | Grey | Metal | Frame | I | 0 |
| 251. | | Grey | Wood | Trim | I | 0 |
| 252. | | Grey | Wood | Wall | I | 0 |
| 253. | | Green | Wood | Window Frame | I | 0 |
| 254. | | Green | Metal | Handrail | I | 0 |
| 255. | | Grey | Metal | Ramp Covering | I | 0 |
| 256. | | Green | Wood | Door Trim | I | 0 |
| 257. | | Green | Metal | Door Frame | I | 0 |
| 258. | | Green | Metal | Door | I | 0 |
| 259. | Portable 75 Interior | Green | Metal | Door | I | 0 |
| 260. | | Green | Metal | Door Frame | I | 0 |
| 261. | Portable 72 | Grey | Wood | Wall | I | 0.02 |
| 262. | | Grey | Metal | Downspout | I | 0.08 |
| 263. | | Green | Metal | Handrail | I | 0.06 |

FACS 35
Forensic Analytical Consulting Services
CELEBRATING 35 YEARS OF EXCELLENCE · 1986–2021

# SURVEY FOR LEAD BASED PAINT

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site Name:** | Monroe Elementary School | | | | | | | | **Date:** | 07/17/2025 |
| **Address:** | 300 Monroe Drive, Hanford, CA 93230 | | | | | | | | **FACS Job #:** | PJ87201 |
| **Start Time:** | 1045 | **Calibration:** | **1.03 =** | 1.03 | **1.03 =** | 1.06 | **1.03 =** | 1.06 | **Technician:** | Ethan McLaughlin |
| **End Time:** | 1345 | **Calibration:** | **1.03 =** | 0.94 | **1.03 =** | 1.03 | **1.03 =** | 1.00 | **Inspector/Assessor:** | Chris Chipponeri |
| **SciAps X-550Pb** \| S/N 01149 | | **Results in red are lead-based paint or coating.** | | | | | | | | **Condition Codes: I = Intact, F = Fair, P = Poor** |

| No. | Sample Location | Color | Substrate | Component | Condition | XRF Result (mg/cm$^2$) |
|---|---|---|---|---|---|---|
| 264. | Portable 72 | Green | Metal | Door Frame | I | 0.13 |
| 265. | | Green | Metal | Door | I | 0 |
| 266. | | Grey | Wood | Wall Panel | I | 0.64 |
| 267. | | Green | Metal | Window Frame | I | 0.03 |
| 268. | Portable 72 Interior | White | Metal | Door | I | 0 |
| 269. | | White | Metal | Door Frame | I | 0.03 |
| 270. | | White | Wood | Wall Panel | I | 0.12 |
| 271. | | White | Metal | Storefront Frame | I | 0.01 |
| 272. | | White | Metal | Frame | I | 0.04 |

# LEAD HAZARD EVALUATION REPORT

**Section 1 — Date of Lead Hazard Evaluation** July 17, 2025

**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 |
|---|---|---|---|
| 300 Monroe Drive | Hanford | Kings | 93230 |

| Construction date (year) of structure | Type of structure | Children living in structure? |
|---|---|---|
| Uknown | ☐ Multi-unit building ☑ School or daycare<br>☐ Single family dwelling ☐ Other_____ | ☐ Yes ☑ No<br>☐ Don't Know |

**Section 4 — Owner of Structure (if business/agency, list contact person)**

| Name | Telephone number |
|---|---|
| Hanford Elementary School District / Daniel Pierotte | 559-585-3628 |

| Address [number, street, apartment (if applicable)] | City | State | Zip Code |
|---|---|---|---|
| 714 North White Street | Hanford | CA | 93230 |

**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_____

**Section 6 — Individual Conducting Lead Hazard Evaluation**

| Name | Telephone number |
|---|---|
| Chris Chipponeri | 559-436-0277 |

| Address [number, street, apartment (if applicable)] | City | State | Zip Code |
|---|---|---|---|
| 2440 West Shaw Avenue, #105 | Fresno | CA | 93711 |

| CDPH certification number | Signature | Date |
|---|---|---|
| LRC-00000782 | | 07/30/25 |

Name and CDPH certification number of any other individuals conducting sampling or testing (if applicable)

Ethan McLaughlin LRC-00014177

**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.

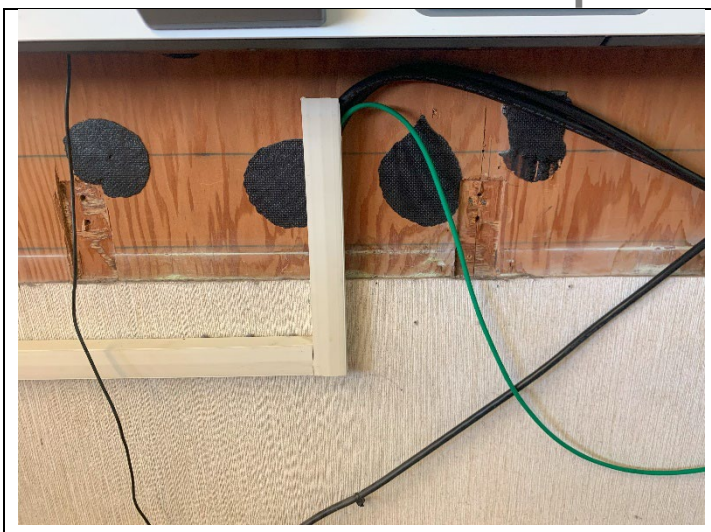
First copy and attachments retained by inspector

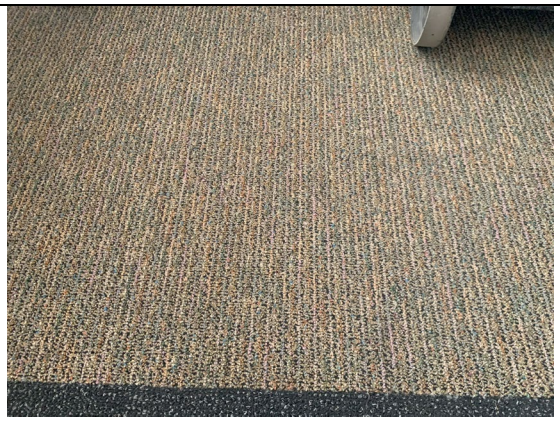
Second copy and attachments retained by owner

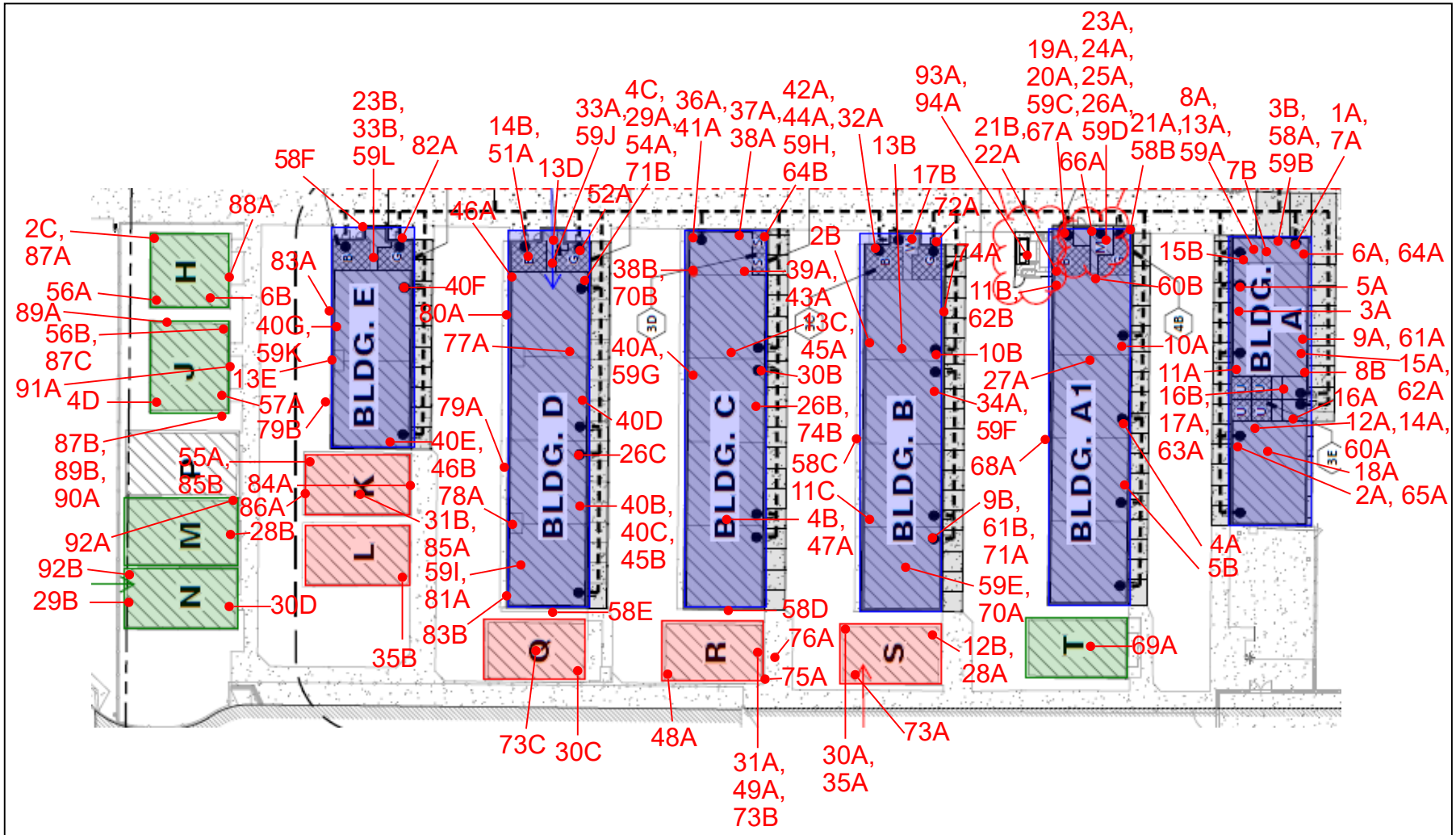
Third copy only (no attachments) mailed or faxed to:

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 C
## Site Photos and Sample Location Drawings

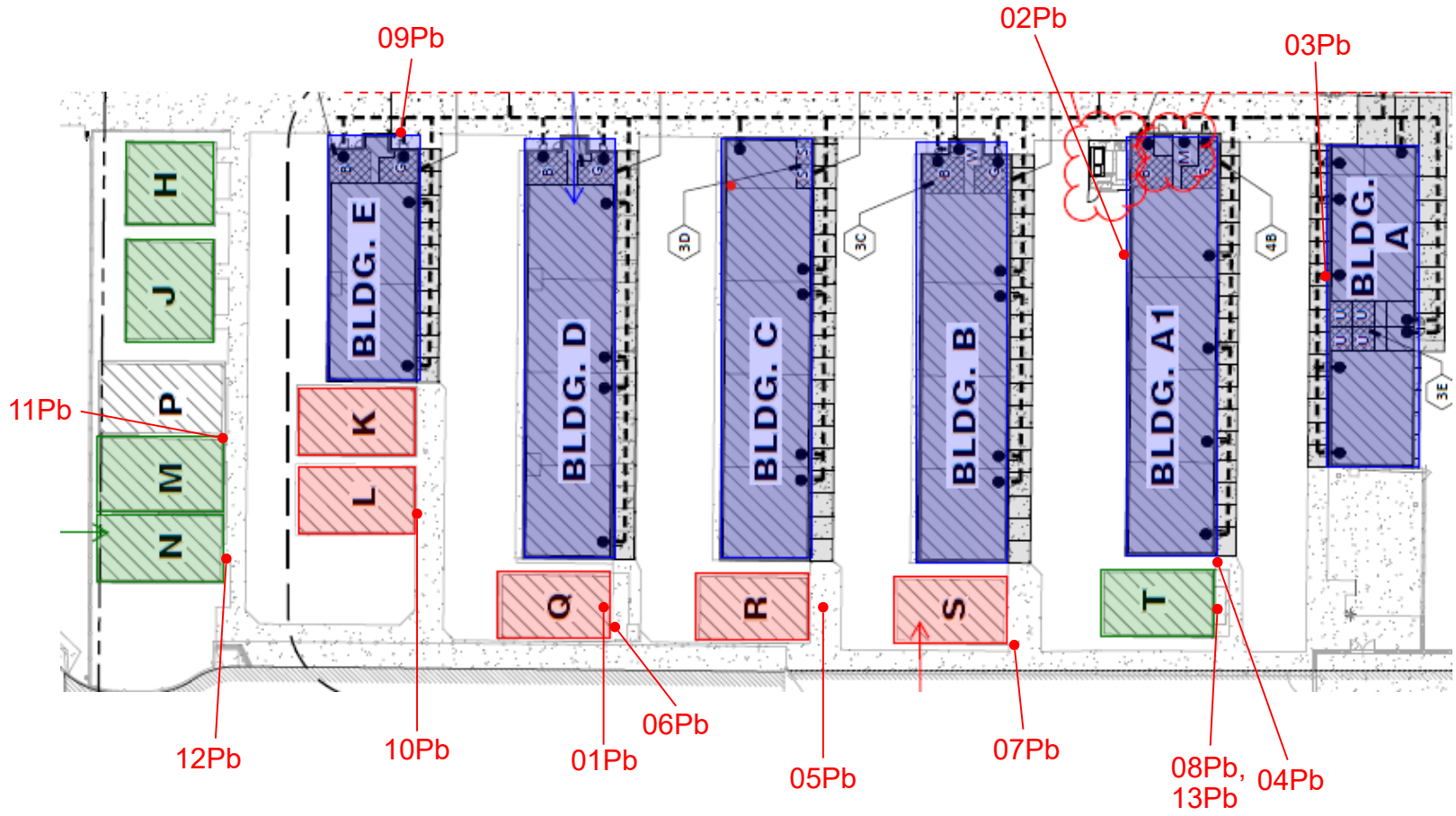
| | |
|---|---|
|  |  |
| Black Mastic Pucks | Door Frame Sealant |
|  |  |
| Vinyl Baseboard Tile and Mastic | Ceramic Tile - Bathrooms |

| | |
|---|---|
|  |  |
| Bolt Mastic – Portables Roofs | 12” ACTs – Random Holes |
|  |  |
| Carpet and Mastic – Black Walk-Off | Carpet and Mastic – Blue – Tan Multi |




| | | | | | |
|---|---|---|---|---|---|
| FACS 35 Forensic Analytical Consulting Services CELEBRATING 35 YEARS OF EXCELLENCE · 1986–2021<br>2440 West Shaw Avenue<br>Fresno, California | N | Sample Location | Sample Location Diagram<br>Buildings A, A1, B, C, D, E, T, S, R, Q, L, K, M, N, J, and H | CLIENT:<br>Hanford Elementary SD | Not Drawn to Scale |
| | | | | LOCATION:<br>300 Monroe Drive,<br>Hanford, CA 93230 | FACS PROJECT No.:<br>PJ87201 |

*This is a design drawing and is the property of Forensic Analytical Consulting Services, Inc. It is not intended to replace required architectural or engineering plans.*




| | | | | | |
|---|---|---|---|---|---|
| FACS 35 Forensic Analytical Consulting Services<br>2440 West Shaw Avenue<br>Fresno, California | N | Sample Location | Sample Location Diagram<br>Buildings A, A1, B, C, D, E, T, S, R, Q, L, K, M, N, J, and H | CLIENT:<br>Hanford Elementary SD<br>LOCATION:<br>300 Monroe Drive,<br>Hanford, CA 93230 | Not Drawn to Scale<br>FACS PROJECT No.:<br>PJ87201 |

*This is a design drawing and is the property of Forensic Analytical Consulting Services, Inc. It is not intended to replace required architectural or engineering plans.*

# Appendix D
## Certifications of Personnel and Laboratories

**STATE OF CALIFORNIA** Gavin Newsom, Governor

DEPARTMENT OF INDUSTRIAL RELATIONS
**Division of Occupational Safety and Health-Asbestos & Carcinogen Unit**
1750 Howe Avenue, Suite 460
Sacramento, CA 95825
(916) 574-2993 Office http://www.dir.ca.gov/dosh/asbestos.html actu@dir.ca.gov

005174633C 339

May 06, 2025

Christopher J Chipponeri
1401 Louise Avenue
Modesto CA 95350

Dear Certified Asbestos Consultant or Technician:

Enclosed is your certification card. **To maintain your certification, you must abide by the rules printed on the back of the certification card.**

Your certification is valid for a period of one year. If you wish to renew your certification, you must apply for renewal at least 60 days before the expiration date shown on your card. [8 CCR 341.15(h)(1)].

Please hold and do not send copies of your required AHERA refresher renewal certificates to our office until you apply for renewal of your certification.

Certificates must be kept current if you are actively working as a CAC or CSST. The grace period is only for those who are not actively working as an asbestos consultant or site surveillance technician.

Please contact our office at the above address or email w any changes in your contact/mailing information within 15 days of the change.

Sincerely,

Dean Mochrie, CAC
Senior Safety Engineer

Attachment: Certification Card

cc: File




*Renewal – Card Attached (08/24)*

# Forensic Analytical Consulting Services, Inc.

*This is to confirm that*

# Chris Chipponeri

*Has attended the Four hour*

## AHERA Refresher Course for Asbestos Inspectors

*And has completed the requisite training for asbestos accreditation under TSCA Title II*

**Course Date: 09-05-2024 to 09-05-2024**

Certificate Number: PETBIR20240099
Valid Until: September 05, 2025

Cal/OSHA Approval Number:CA-025-06

FACS
Forensic Analytical Consulting Services

Fred J. Vinciguerra, Chief Executive Officer
Forensic Analytical Consulting Services, Inc.
21228 Cabot Blvd, Hayward, CA 94545
(800) 677-1483

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

# LEAD-RELATED CONSTRUCTION CERTIFICATE

| INDIVIDUAL: | CERTIFICATE TYPE: | NUMBER: | EXPIRATION DATE: |
|---|---|---|---|
|  **Chris Chipponeri** | Lead Inspector/Assessor | LRC-00000782 | 6/20/2026 |

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

# Forensic Analytical Consulting Services, Inc.

*This is to confirm that*

# Ethan Mclaughlin

*Has attended the Twenty Four hour*

## Building Inspector Initial

*And has completed the requisite training for asbestos accreditation under TSCA Title II*

**Course Date: 07-07-2025 to 07-09-2025**

Certificate Number: PETBII2025008
Valid Until: July 09, 2026

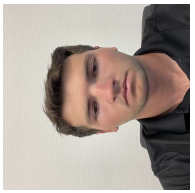
Cal/OSHA Approval Number:CA-025-05

FACS
Forensic Analytical Consulting Services

Fred J. Vinciguerra, Chief Executive Officer
Forensic Analytical Consulting Services, Inc.
21228 Cabot Blvd, Hayward, CA 94545
(800) 677-1483

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

# LEAD-RELATED CONSTRUCTION CERTIFICATE

| INDIVIDUAL: | CERTIFICATE TYPE: | NUMBER: | EXPIRATION DATE: |
|---|---|---|---|
|  **Ethan Mclaughlin** | Lead Sampling Technician | LRC-00014177 | 5/22/2026 |

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

**United States Department of Commerce**
**National Institute of Standards and Technology**

# Certificate of Accreditation to ISO/IEC 17025:2017

**NVLAP LAB CODE: 101459-0**

## SGS Forensic Laboratories

Hayward, CA

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:*

## Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).*

2025-07-01 through 2026-06-30

*Effective Dates*

*For the National Voluntary Laboratory Accreditation Program*

# National Voluntary Laboratory Accreditation Program

## SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

**SGS Forensic Laboratories**
19743 Cabot Blvd.
Hayward, CA 94545
Ryan Sutliffe
Phone: 702-332-1937
Email: ryan.sutliffe@sgs.com
www.falaboratories.com

**ASBESTOS FIBER ANALYSIS** **NVLAP LAB CODE 101459-0**

### Bulk Asbestos Analysis

| *Code* | *Description* |
|---|---|
| 18/A01 | EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples |
| 18/A03 | EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials |

### Airborne Asbestos Analysis

| *Code* | *Description* |
|---|---|
| 18/A02 | U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A. |



*For the National Voluntary Laboratory Accreditation Program*

# AIHA Laboratory Accreditation Programs, LLC

*acknowledges that*

## SGS North America

**19743 Cabot Blvd. Hayward, CA 94545**

**Laboratory ID: LAP-101762**

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs, LLC (AIHA LAP) accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

### LABORATORY ACCREDITATION PROGRAMS

| | | |
|---|---|---|
| ☑ | **INDUSTRIAL HYGIENE** | Accreditation Expires: October 01, 2025 |
| ☑ | **ENVIRONMENTAL LEAD** | Accreditation Expires: October 01, 2025 |
| ☑ | **ENVIRONMENTAL MICROBIOLOGY** | Accreditation Expires: October 01, 2025 |
| ☐ | **FOOD** | Accreditation Expires: |
| ☐ | **UNIQUE SCOPES** | Accreditation Expires: |
| ☐ | **BE FIELD/MOBILE** | Accreditation Expires: |

Specific Field(s) of Testing/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP website (www.aihaaccreditedlabs.org) for the most current Scope.

*Cheryl O Morton*
*Managing Director, AIHA Laboratory Accreditation Programs, LLC*

Revision21: 10/24/2023

Date Issued: 06/30/2025

**Right People**

**Right Perspective**

**Right Now**

**www.forensicanalytical.com**

**SECTION 00 3110 - PRELIMINARY SCHEDULES**

**1. START OF WORK:** Do not start work until receipt of written notice from Architect to proceed.

**2. PROJECT SCHEDULE:**

**.1 Anticipated Award Date:** January 29, 2026. This date is for preliminary scheduling only; Owner does not guarantee this date.

**.2 Anticipated Notice to Proceed Date:** February 16, 2026. This date is for preliminary scheduling only; Owner does not guarantee this date.

**.3 Time for Completion:** Complete all Work within **419 calendar days,** commencing with the date established in the written notice from Owner to proceed, and ending with the date of Notice of Completion.

**3. OWNER OCCUPANCY**

**.1** The schedule is intended as a maximum time frame and should the Contractor be able to expedite the Work, the Owner and Architect will assist in advancing within the terms of the Contract.

**.2** The project will be in progress while students and staff are on site.

**4. PROJECT PHASING:**

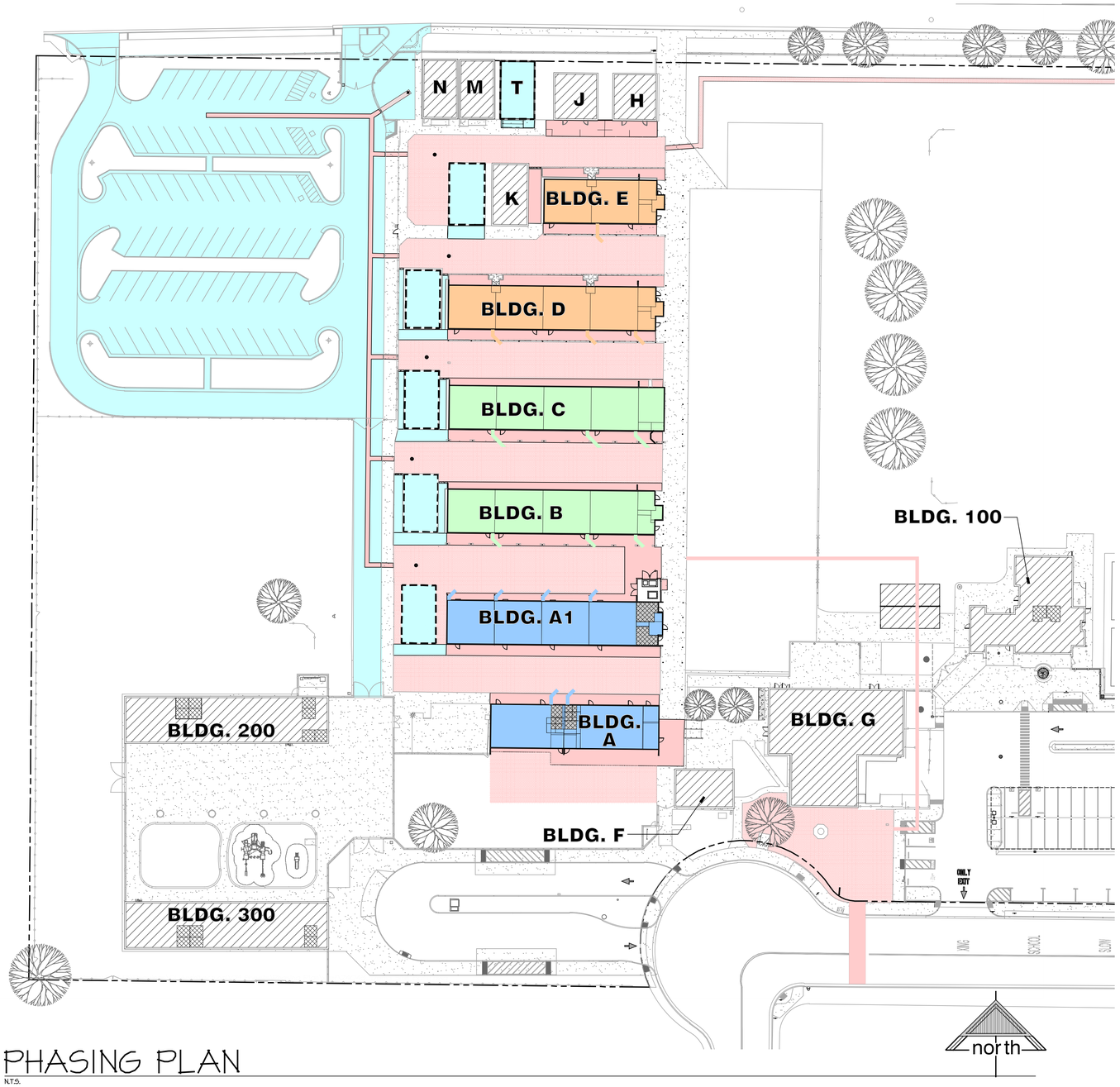
**.1 Phase 1:** Pre-Construction from February 16, 2026 – April 27, 2026. (70 calendar days).
**.2 Phase 2:** Buildings A and A1 from April 28, 2026 – August 6, 2026. (100 calendar days).
**.3 Phase 3:** Sitework, Site Plumbing, Site Storm Drain & Exterior Painting from June 8, 2026 – August 7, 2026. (60 calendar days).
**.4 Phase 4:** Buildings B and C from August 7, 2026 – November 15, 2026. (100 calendar days).
**.5 Phase 5:** Buildings D and E from November 16, 2026 – February 24, 2027. (100 calendar days).
**.6 Phase 6**: Removal of Existing Relocatable Buildings, Relocation of Relocatable Building 'T' and Striping/Sealing of Existing Parking Lot from February 25, 2027 – April 11, 2027. (45 calendar days).

**.7** See attached for Monroe Elementary School Modernization Site Phasing Plan Graphic, attached to the end of this section.

**END OF SECTION 00 3110**

# MONROE ELEMENTARY SCHOOL MODERNIZATION

## PROPOSED CONSTRUCTION PHASING SCHEDULE




PHASING PLAN

N.T.S.

### PHASE 1 (70 DAYS)

PRE-CONSTRUCTION (2/16/26 - 4/27/26)
- REVIEW SUBMITTALS
- PROCUREMENT OF LONG LEAD ITEMS

### PHASE 2 (100 DAYS)

PHASE 2 (4/28/26 - 8/6/26)
- BUILDING A
- BUILDING A1

### PHASE 3 (60 DAYS)

PHASE 3 (6/8/26 - 8/7/26) SUMMER
- SITEWORK
- SITE PLUMBING
- SITE STORM DRAIN
- EXTERIOR PAINTING

### PHASE 4 (100 DAYS)

PHASE 4 (8/7/26 - 11/15/26)
- BUILDING B
- BUILDING C

### PHASE 5 (100 DAYS)

PHASE 5 (11/16/26 - 2/24/27)
- BUILDING D
- BUILDING E

### PHASE 6 (45 DAYS)

PHASE 6 (2/25/27 - 4/11/27)
- REMOVAL OF EXISTING RELOS
- RELOCATION OF RELO 'T'
- STRIPING & SEALING PARKING LOT

TIME OF COMPLETION:
419 CALENDAR DAYS

| 2025 | 2026 | | | | | | | | | | | | 2027 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR |

BIDDING → CONTRACT → PHASE 1 (70 DAYS) → PHASE 2 (100 DAYS) → PHASE 4 (100 DAYS) → PHASE 5 (100 DAYS) → PHASE 6 (45 DAYS)

PHASE 3 (60 DAYS)

MANGINI ARCHITECTURE INGENUITY

11.11.2025 PROJECT # 24043

**SECTION 00 4110 - BID FORM**

**BID TO:** **Hanford Elementary School District**
**714 North White Street**
**Hanford, CA 93230**

**BID FROM:** _____

_____

_____

Phone: _____ Fax: _____

Email:_____

**PROJECT:** **MODERNIZATION AT MONROE ELEMENTARY SCHOOL**

**BASIS FOR BIDS:** All work required for construction of the Modernization at Monroe Elementary School, located at 300 Monroe Drive, Hanford, California.

The undersigned, having carefully examined the location of the proposed work, the local conditions of the place where the work is to be performed, the Invitation to Bid, the Instructions to Bidders, the Drawings, the Specifications, the Agreement, the General Conditions, all addenda, and all Contract Documents for this Project, proposes and agrees to be bound by all terms and conditions of the complete contract and agrees to perform, within the time stipulated, the contract, including all of its component parts, and everything required to be performed, and to provide and furnish any and all of the labor, materials, tools, expendable equipment, and all applicable taxes, utility and transportation services necessary to perform the contract and complete in a good workmanlike manner all of the work required, including sheeting, shoring and bracing, or equivalent method for protection of life and limb in trenches and open excavation in conformance with applicable safety orders, in connection with the Project called for by them for the entire order in strict conformity with the Contract Documents.

**ADDENDA:** The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Addendum # | _____ | Dated | _____ | Addendum # | _____ | Dated | _____ |
| Addendum # | _____ | Dated | _____ | Addendum # | _____ | Dated | _____ |
| Addendum # | _____ | Dated | _____ | Addendum # | _____ | Dated | _____ |

**BASE BID:** Lump Sum price for construction of the Base Bid portions of the Project (in accordance with the Contract Documents):

_____

_____Dollars ($_____)

**CASH ALLOWANCES:**

**.1** A cash allowance of **$15,000.00 for repair of existing sprinkler irrigation system and landscaping**, as described in Section 01 2100 - Cash Allowances, is included in the Base Bid.

**UNIT PRICES:**

**.1** **DRY ROT REPAIR:** State the cost for repair of dryrot discovered during removal of existing roofing. This amount shall include removal of dryrot material (including sheathing and joists), replacement (including sheathing and joists), labor, materials, taxes, delivery, overhead and profit.

Plywood Sheathing - Cost per square foot: _____

Roof Sheathing (1x6 boards) - Cost per lineal foot: _____

Roof Joists or rafters - Cost per lineal foot: _____

**CALIFORNIA STATEWIDE CRUDE OIL PRICE INDEX:**

Compensation for price index fluctuations for copper conductors sized #2 and larger shall be adjusted based on Exhibit "A" attached to Specification Section 32 1210. The Contractor shall provide the following information to establish the baseline costs for asphalt oil:

**.1** Project asphalt oil tonnage: _____

**.2** California Statewide Crude Oil Price Index in effect on date of bid: _____

**CONDITIONS**

**Bid Form:**

**.1** Bidder agrees that he/she has checked carefully all words and figures inserted in the Bid Form and that he/she is solely responsible for errors or omissions therein.

**.2** Forms submitted with incomplete bid amounts or signature are subject to non-acceptance by Owner. Amounts shall be stated in writing and figures.

**.3** Owner reserves the right to reject any or all Bids, waive any informality in any Bid, determine in his own discretion the responsibility of any Bidder, and determine which Bid is most advantageous to Owner.

**Bid Form Attachments:** Bid Form shall be accompanied the following, using forms included in the Project Manual:

**.1** Bid Form
**.2** Bidder's Bond
**.3** Subcontractor List / DIR Information
**.4** Non-Collusion Affidavit
**.5** Contractor's Certificate Regarding Workers Compensation
**.6** Fingerprinting Notice and Acknowledgment
**.7** Sufficient Funds Declaration
**.8** Acknowledgment regarding Drug Free Workplace
**.9** Acknowledgment regarding Alcoholic Beverage and Tobacco-Free Campus Policy
**.10** Acknowledgment regarding No Contracting with Sanctioned Entities
**.11** CARB Compliance Declaration
**.12** Roof Project Certification
**.13** Prime Bidder Good Faith Effort Worksheet and Prime Bidder Certification of Disabled Veteran Business Enterprise Participation.

**Time for Completion:** Bidder agrees to complete all Work within **419 calendar days,** commencing with the date established in the written notice from Owner to proceed, and ending with the date of Substantial Completion.

**Substitutions:** Bidder agrees he/she has reviewed the substitution requirements of Sections 00 2110 and 01 2500 and shall comply with such requirements.

**Execution of Agreement:** Bidder agrees that if its bid or bids are accepted by Owner, Bidder will execute the Agreement Form provided and furnish the required Bonds and Insurance Certificates within 7 calendar days after date of written Notice of Award by Owner. The undersigned further agrees that in case of default in executing these documents within the time fixed, the proceeds of the check or bond, accompanying this bid, shall become the property of the Owner.

**Withdrawal of Bid:** Bidder agrees that his/her Bid may not be withdrawn for a period of **60 calendar days** after Bid Opening date.

**Step One Liquidated Damages:** Should the Contractor fail to complete this contract, and/or each phase of the work provided therein within the time fixed for such completion, pursuant to Government Code Section 53069.85, said Contractor shall forfeit and pay (or the Owner may deduct the amount thereof from any money due or to become due to the Contractor) the sum of **One Thousand Dollars ($1,000.00)** per calendar day as Step One Liquidated Damages. In accordance with the provisions of Government Code Section 4215, the Contractor shall not be assessed liquidated damages where delay is caused by failure of the Owner or the owner of the utility to provide for the removal or relocation of utility facilities, but only if such facilities are not identified in the plans and specifications.

**Step Two Liquidated Damages:** Should the Contractor fail to complete and closeout this contract within 65 days of the Notice of Completion, pursuant to Government Code Section 53069.85, said Contractor shall forfeit and pay (or the Owner may deduct the amount thereof from any money due or to become due to the Contractor) the sum of **Two Hundred and Fifty Dollars ($250.00)** per calendar day as Step Two Liquidated Damages, in addition to amounts which may be assessed for Step One liquidated damages.

**Bidder's Representation as to Bids:** Bidder certifies that his/her Bid is genuine and is not sham or collusive, or made in the interest or in behalf of any Bidder not herein named, and that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a sham bid, or any other possible bidder to refrain from bidding, and that Bidder has not in any manner sought by collusion to secure for himself an advantage over any other Bidder.

**Contractor's License:** Contractors and subcontractors are required by law to be licensed and regulated by the Contractors' State License Board, which has jurisdiction to investigate complaints against contractors if a complaint is filed within 4 years of the date of the alleged violation. A complaint regarding alleged act or omission pertaining to structural defects must be filed within 10 years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, 3132 Bradshaw Road, Sacramento, California. Mailing address: P.O. Box 26000, Sacramento, California 95826.

**Worker's Compensation:** The bidder hereby certifies that it is aware of the provisions of Section 3700 of the Labor Code 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 will comply with such provisions before commencing the performance of the work of this contract.

**Authorized Signature:** Bidder states that the signature below is of a person authorized to bind the Bidder to this Bid and the Agreement.

**Wage Rates:** The Bidder agrees to comply with the prevailing wage laws as set forth in Labor Code sections 1770-1780 unless an applicable federal labor law imposes a higher wage or stricter requirement, in which case the higher wage or stricter requirement will apply. The Contractor agrees to be responsible for the compliance by all subcontractors with Labor Code Section 1776. Pursuant to Labor Code Section 1770, the Bidder shall, as a penalty to the Owner, forfeit not more than $50 for each calendar day or portion thereof, for each worker paid less than the prevailing rates as determined by the director for the work or craft in which the worker is employed. The amount of this penalty shall be determined by the California State Labor Commissioner and shall be based on consideration of the Contractor's mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor in meeting his or her prevailing wage obligations, or the Contractor's willful failure to pay the correct rates of prevailing wages. In accordance with the Public Contract Code Section 6109, with respect to subcontractors which are ineligible to perform work on public works projects pursuant to Labor Code Section 1777.1 or 1777.7:

**.1** The Bidder shall not allow any such subcontractor to work of this project.

**.2** The Bidder shall repay to the Owner any money paid to any such subcontractor allowed to work on this project.

**.3** The Bidder shall pay the wages of the workers of any such subcontractor allowed to work on this project. Copies of the prevailing rate of per diem wages are on file at the principal office of the Owner, and are available to any interested party upon request, pursuant to Labor Code Section1773 and Section1773.2. **The Bidder shall comply with provisions of the Labor Code Section 1775 regarding penalties for failure to pay prevailing wages.**

**DIR Registration:** The Contractor and any proposed subcontractors shall not be qualified to submit a bid or to be listed in a bid proposal for the Project unless currently registered and qualified under Labor Code section 1725.5 to perform public work as defined by Division 2, Part 7, Chapter 1 (§§1720 et seq.) of the Labor Code.

**Labor Compliance Program:** Contractor and all subcontractors shall comply with Labor Code section 1776. In accordance with Labor Code section 1771.4(a)(1), the Project is subject to compliance monitoring and enforcement by the DIR. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner on a monthly basis, unless directed by the Owner to furnish such records more often, and in the format prescribed by the Labor Commissioner.

**Qualified Bidder List:** Pursuant to Public Contract Code section 20111.6, all general contractors and mechanical, electrical and plumbing subcontractors in license classifications A, B, C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C- 42, C- 43 and C- 46 who intend to bid on the project must be pre-qualified. No bid will be accepted for such projects from subcontractors in the listed license categories that are not on the Owner's Qualified Bidder List.

**DVBE Requirements:** The Owner will require the successful Bidder to achieve the minimum goal of 3% DVBE (Disabled Veteran Business Enterprises) established in the bidding documents or to provide acceptable evidence of good faith efforts to do so.

If the bidder is a corporation, the undersigned hereby represents and warrants that the corporation is duly incorporated and is in good standing in the State of _____ and that _____(Name), whose title is _____, is authorized to act for and bind the corporation.

The undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: _____

_____
Bidder Name (type or print)

_____
Authorized Signator (type of print)

_____
Signature

_____
Organization (individual, partnership, or corporation)

_____
Address

_____
Contractor's License Number Class

_____
Contractor's License Expiration Date

**SUBCONTRACTOR LIST / DIR INFORMATION**

Public Contract Code Section 4100 / Labor Code Section 1725.5

Contractor: _____

**Subcontractor List:** Subcontracting under this Agreement shall be governed by the California "Subletting and Subcontracting Fair Practices Act" (Chapter 4, commencing at Section 4100, Division 2, Part 1 of the Public Contract Code of the State of California and any amendments thereof). In accordance with the provisions of Public Contract Code Section 4104, each bidder shall list below the name and location of place of business for each subcontractor licensed by the State of California who, under subcontract to the prime contractor, will perform a portion of the contract work in an amount in excess of one-half (1/2) of one percent (1%) of the total contract price. In each such instance the nature of the work to be sublet shall be described.

If a prime contractor fails to specify a subcontractor or if a prime contractor specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half (1/2) of one percent (1%) of the prime contractor's total bid, Contractor shall be deemed to have agreed that Contractor alone shall perform that portion.

No prime contractor whose bid is accepted shall (a) substitute any subcontractor, (b) permit any subcontractor to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid, or (c) sublet or subcontract any portion of the work in excess of one-half (1/2) of one percent (1%) of the prime contractor's total bid as to which the original bid did not designate a subcontractor, except as authorized in the Subletting and Subcontracting Fair Practices Act. Subletting or subcontracting of any portion of the work in excess of one-half (1/2) of one percent (1%) of the prime contractor's total bid as to which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, only after a finding reduced to writing as a public record of the authority awarding this contract setting forth the facts constituting the emergency or necessity.

**DIR Information:** Pursuant to Labor Code section 1725.5, Within 24 hours of the receipt of bids, the apparent low bidder shall provide the contractor's license number, and DIR registration number of all subcontractors listed on the Subcontractor List submitted with the Bid. The Contractor and any proposed subcontractors shall not be qualified to submit a bid or to be listed in a bid proposal for the Project unless currently registered and qualified under Labor Code Section 1725.5 to perform public work.

An inadvertent error in listing a subcontractor who is not registered under Labor Code Section 1725.5 shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive, provided that either: the subcontractor is registered prior to the bid opening; or the subcontractor is registered and has paid the penalty registration fee specified in Labor Code section 1725.5(a)(2)(E), if applicable, within 24 hours after the bid opening; or the subcontractor is replaced by another registered subcontractor under Public Contract Code Section 4107. Failure of a listed subcontractor to be registered shall be grounds under Public Contract Code Section 4107 for the Contractor, with the Owner's consent, to substitute a registered subcontractor for the unregistered subcontractor.

| Submit with Bid - Contractor: _____ | | | Submit within 24 Hours of Bid | |
|---|---|---|---|---|
| Portion of Work | Subcontractor Name | Subcontractor Location | License Number | DIR Registration Number |
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| Submit with Bid - Contractor: _____ | | | Submit within 24 Hours of Bid | |
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| Portion of Work | Subcontractor Name | Subcontractor Location | License Number | DIR Registration Number |
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| Submit with Bid - Contractor: _____ | | | Submit within 24 Hours of Bid | |
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**NON-COLLUSION AFFIDAVIT**
Public Contract Code Section 7106

**To:** _____

**Project:** _____

_____

The undersigned declares:

I am the _____ [Title] of _____ [Company], the party making a bid proposal (bid) on the above-referenced Project. The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

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

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 _____ , 2023, at _____ [City], California.

_____
Date

_____
Printed Name

_____
Signature

**CONTRACTOR'S CERTIFICATE REGARDING WORKER'S COMPENSATION**
Labor Code Section 3700

California Labor Code Section 3700, in relevant part, provides that:

Every employer except the state shall secure the payment of compensation in one or more of the following ways:

(a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.

(b) By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer or as one employer in a group of employers. Said certificate may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees, … "

I am aware of the provisions of the Labor Code section 3700 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. I shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation.

_____
Proper Name of Company

_____
Printed Name

_____
Signature

In accordance with Article 5 [commencing at Section 1860], Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under this contract.

**FINGERPRINTING NOTICE AND ACKNOWLEDGMENT**
Education Code Section 45125.2

Business entities entering into contracts with the Owner for the construction, reconstruction, rehabilitation or repair of a facility may comply with Education Code section 45125.2, in which case it would not have to comply with Section 45125.1. If such an entity is not compliant with Section 45125.2, then it must comply with Section 45125.1. Such entities are responsible for ensuring full compliance with the law and should therefore review all applicable statutes and regulations. Therefore, the following information is provided simply to assist you with compliance with the law:

1. The Owner has determined that your employee(s), or you as a sole proprietor, will have more than limited contact with students, therefore the law requires that you must use one or more of the following methods to ensure the safety of pupils (Education Code §45125.2(a)):

   a. Install a physical barrier at the work site to limit contact with pupils.

   b. If you are not a sole proprietorship, have one of your employees, whom the Department of Justice has ascertained has not been convicted of a violent or serious felony (see ***Attachment A*** to this Notice and Acknowledgement), continually monitor and supervise all of your employees. For the Department of Justice to so ascertain, your employee may submit fingerprints to the Department of Justice pursuant to Education Code section 45125.1(a).

   c. Arrange, with Owner's approval, for surveillance of your employees by Owner's personnel.

   Prior to commencing the Work, you shall submit the Independent Contractor Student Contact Form (see ***Attachment B*** to this Notice and Acknowledgement) to the Owner, which will indicate which of the above methods you will use. ***Attachment B*** is not a Bid Form Attachment required as a part of the bid package.

2. If you are providing services in an emergency or exceptional situation, you are not required to comply with Education Code section 45125.2, above. An "emergency or exceptional" situation is one in which pupil health or safety is endangered or when repairs are needed to make a facility safe and habitable. Owner shall determine whether an emergency or exceptional situation exists. (Education Code §45125.2(d).)

3. If you use one or more of the three methods in Section 1 (above), you are not required to comply with Education Code section 45125.1. (Education Code §45125.2(b).)

I have read the foregoing and agree to comply with the requirements of this notice and Education Code sections 45125.1 and 45125.2 as applicable.

| | |
|---|---|
| _____ | _____ |
| Date | Signature |
| _____ | _____ |
| Printed Name | Title |

**ATTACHMENT A**

**FINGERPRINTING NOTICE AND ACKNOWLEDGMENT**

Under Education Code section 45125.1, no employee of a contractor or subcontractor who has been convicted of or has criminal proceedings pending for a violent or serious felony may come into contact with any student. A violent felony is any felony listed in subdivision (c) of Section 667.5 of the Penal Code. Those felonies are presently defined as:

(1) Murder or voluntary manslaughter.
(2) Mayhem.
(3) Rape as defined in paragraph (2) or (6) of subdivision (a) of Section 261 or paragraph (1) or (4) of subdivision (a) of Section 262.
(4) Sodomy as defined in subdivision (c) or (d) of Section 286.
(5) Oral copulation as defined in subdivision (c) or (d) of Section 288a.
(6) Lewd or lascivious act as defined in subdivision (a) or (b) of Section 288.
(7) Any felony punishable by death or imprisonment in the state prison for life.
(8) Any felony in which the defendant inflicts great bodily injury on any person other than an accomplice which has been charged and proved as provided for in Section 12022.7, 12022.8, or 12022.9 on or after July 1, 1977, or as specified prior to July 1, 1977, in Sections 213, 264, and 461, or any felony in which the defendant uses a firearm which use has been charged and proved as provided in subdivision (a) of Section 12022.3, or Section 12022.5 or 12022.55.
(9) Any robbery.
(10) Arson, in violation of subdivision (a) or (b) of Section 451.
(11) Sexual penetration as defined in subdivision (a) or (j) of Section 289.
(12) Attempted murder.
(13) A violation of Section 12308, 12309, or 12310.
(14) Kidnapping.
(15) Assault with the intent to commit a specified felony, in violation of Section 220.
(16) Continuous sexual abuse of a child, in violation of Section 288.5.
(17) Carjacking, as defined in subdivision (a) of Section 215.
(18) Rape, spousal rape, or sexual penetration, in concert, in violation of Section 264.1.
(19) Extortion, as defined in Section 518, which would constitute a felony violation of Section 186.22 of the Penal Code.
(20) Threats to victims or witnesses, as defined in Section 136.1, which would constitute a felony violation of Section 186.22 of the Penal Code.
(21) Any burglary of the first degree, as defined in subdivision (a) of Section 460, wherein it is charged and proved that another person, other than an accomplice, was present in the residence during the commission of the burglary.
(22) Any violation of Section 12022.53.
(23) A violation of subdivision (b) or (c) of Section 11418.

A serious felony is any felony listed in subdivision (c) Section 1192.7 of the Penal Code. Those felonies are presently defined as:

(1) Murder or voluntary manslaughter;
(2) Mayhem;
(3) Rape;
(4) Sodomy by force, violence, duress, menace, threat of great bodily injury, or fear of immediate and unlawful bodily injury on the victim or another person;
(5) Oral copulation by force, violence, duress, menace, threat of great bodily injury, or fear of immediate and unlawful bodily injury on the victim or another person;
(6) Lewd or lascivious act on a child under the age of 14 years;
(7) Any felony punishable by death or imprisonment in the state prison for life;
(8) Any felony in which the defendant personally inflicts great bodily injury on any person, other than an accomplice, or any felony in which the defendant personally uses a firearm;
(9) Attempted murder;
(10) Assault with intent to commit rape, or robbery;
(11) Assault with a deadly weapon or instrument on a peace officer;
(12) Assault by a life prisoner on a non-inmate;
(13) Assault with a deadly weapon by an inmate;

(14) Arson;
(15) Exploding a destructive device or any explosive with intent to injure;
(16) Exploding a destructive device or any explosive causing bodily injury, great bodily injury, or mayhem;
(17) Exploding a destructive device or any explosive with intent to murder;
(18) Any burglary of the first degree;
(19) Robbery or bank robbery;
(20) Kidnapping;
(21) Holding of a hostage by a person confined in a state prison;
(22) Attempt to commit a felony punishable by death or imprisonment in the state prison for life;
(23) Any felony in which the defendant personally used a dangerous or deadly weapon;
(24) Selling, furnishing, administering, giving, or offering to sell, furnish, administer, or give to a minor any heroin, cocaine, phencyclidine (PCP), or any methamphetamine-related drug, as described in paragraph (2) of subdivision (d) of Section 11055 of the Health and Safety Code, or any of the precursors of methamphetamines, as described in subparagraph (A) of paragraph (1) of subdivision (f) of Section 11055 or subdivision (a) of Section 11100 of the Health and Safety Code;
(25) Any violation of subdivision (a) of Section 289 where the act is accomplished against the victim's will by force, violence, duress, menace, or fear of immediate and unlawful bodily injury on the victim or another person;
(26) Grand theft involving a firearm;
(27) Carjacking;
(28) any felony offense, which would also constitute a felony violation of Section 186.22;
(29) assault with the intent to commit mayhem, rape, sodomy, or oral copulation, in violation of Section 220;
(30) throwing acid or flammable substances, in violation of Section 244;
(31) assault with a deadly weapon, firearm, machine gun, assault weapon, or semiautomatic firearm or assault on a peace officer or firefighter, in violation of Section 245;
(32) assault with a deadly weapon against a public transit employee, custodial officer, or school employee, in violation of Sections 245.2, 245.3, or 245.5;
(33) discharge of a firearm at an inhabited dwelling, vehicle, or aircraft, in violation of Section 246;
(34) commission of rape or sexual penetration in concert with another person, in violation of Section 264.1;
(35) continuous sexual abuse of a child, in violation of Section 288.5;
(36) shooting from a vehicle, in violation of subdivision (c) or (d) of Section 12034;
(37) intimidation of victims or witnesses, in violation of Section 136.1;
(38) criminal threats, in violation of Section 422;
(39) any attempt to commit a crime listed in this subdivision other than an assault;
(40) any violation of Section 12022.53;
(41) a violation of subdivision (b) or (c) of Section 11418; and
(42) any conspiracy to commit an offense described in this subdivision.

**ATTACHMENT B**

**INDEPENDENT CONTRACTOR STUDENT CONTACT FORM**

Contractor Name: _____
Supervisor/Foreman Name: _____
Start Date: _____
Completion Date: _____
Location of Work: _____
Hours of Work: _____
Length of Time on Grounds: _____
Number of Employees on the Job: _____

Yes No
[ ] [ ] Employees or sole proprietor will have more than limited contact with students as determined by Owner, or if by Contractor, please explain:

_____

_____

If yes, the following steps will be taken to ensure student safety (check):

[ ] A physical barrier will be installed at the worksite to limit contact with pupils.

[ ] Employees (if not a sole proprietorship) will be continually monitored and supervised by an employee who has not been convicted of a violent or serious felony.

Name of Supervising Employee:

_____

Date of Department of Justice verification that supervising employee has not been convicted of a violent or serious felony:

_____

Name of employee who is the custodian of the Department of Justice verification information:

_____

[ ] Owner agrees: Employees or sole proprietor will be surveilled by Owner's personnel.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

_____ _____
Date Signature

_____ _____
Printed Name Title

**SUFFICIENT FUNDS DECLARATION**
Labor Code Section 2810

**To:** _____

**Project:** _____

_____

I, _____[Bidder Name], declare that I am the _____[Title] of _____ [Company], the entity making a bid for the above-referenced Project, and that the bid submitted by _____ [Company] includes sufficient funds to permit _____ [Company] and all subcontractors to comply with all local, state or federal labor laws or regulations during the Project, including payment of prevailing wages.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: _____,20

Signature: _____

Print Name: _____

Print Title: _____

**CONTRACTOR'S CERTIFICATE REGARDING DRUG-FREE WORKPLACE**

This Drug-Free Workplace Certification form is required from all successful bidders pursuant to the requirements mandated by Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any State agency must certify that it will provide a drug-free workplace by performing certain specified acts. In addition, the Act provides that each contract or grant awarded by a State agency may be subject to suspension of payments or termination of the contract or grant, and the Contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

Pursuant to Government Code section 8355, every person or organization awarded a contract or grant from a State agency shall certify that it will provide a drug-free workplace by doing all of the following:

1. Publishing a statement, notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace, and specifying actions which will be taken against employees for violations of the prohibition.
2. Establishing a drug-free awareness program to inform employees about all of the following:
   a. The dangers of drug abuse in the workplace;
   b. The person's or organization's policy of maintaining a drug-free workplace;
   c. The availability of drug counseling, rehabilitation and employee-assistance programs; and
   d. The penalties that may be imposed upon employees for drug abuse violations;
3. Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by subdivision (a) and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code section 8355 listed above and will (a) publish a statement notifying employees concerning the prohibition of controlled substance at the workplace, (b) establish a drug-free awareness program, and (c) require each employee engaged in the performance of the contact be given a copy of the statement required by section 8355(a) and require such employee agree to abide by the terms of that statement.

I also understand that if the Owner determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of Section 8355, that the contract awarded herein is subject to termination, suspension of payments, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of Section 8350 et seq.

I acknowledge that I am aware of the provisions of Government Code section 8350 et seq. and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

_____ _____

Date Contractor

By: _____

Signature

**CONTRACTOR'S CERTIFICATE REGARDING ALCOHOLIC BEVERAGE AND TOBACCO-FREE CAMPUS POLICY**

The Contractor agrees that it will abide by and implement the Owner's Alcoholic Beverage and Tobacco-Free Campus Policy, which prohibits the use of alcoholic beverages and tobacco products, of any kind and at any time, in buildings owned or leased by Owner, on Owner's property and in Owner's vehicles. The Contractor shall procure signs stating "ALCOHOLIC BEVERAGE AND TOBACCO USE IS PROHIBITED" and shall ensure that these signs are prominently displayed in all entrances to school property at all times.

_____ _____

Date Contractor

By: _____

Signature

**CONTRACTOR CERTIFICATION REGARDING SANCTIONED ENTITIES & IRAN CONTRACTING ACT**

_____ ("Contractor") certifies as follows:

1. Contractor is not an entity under any form of sanction imposed by the United States of America, or the State of California, and is not listed as such by the U.S. Department of State (a "Sanctioned Entity"), which list may be referenced at: https://sanctionssearch.ofac.treas.gov/ or
https://www.treasury.gov/ofac/downloads/ssi/ssilist.pdf.
Further, Contractor is not an Affiliate (any person or entity directly or indirectly controlling; controlled by or under common control with Contractor; owned in whole or in part by Contractor; that owns any interest in Contractor, in whole or in part; that is a current creditor or debtor to Contractor) of any Sanctioned Entity.
2. Contractor shall exercise all due diligence, including, without limitation, consulting the U.S. Department of State list of sanctioned entities, which may be referenced at https://sanctionssearch.ofac.treas.gov or https://www.treasury.gov/ofac/downloads/ssi/ssilist.pdf to ensure Contractor is not currently party to any contract with, and shall not enter into any contractual relationship with any Sanctioned Entity during the term of any agreement by and between Contractor and Owner or in relation to any agreement by and between Contractor and Owner.
3. Pursuant to Public Contract Code 2204, Contractor affirms that the official named below certifies they are duly authorized to execute this certification on behalf of the Contractor/financial institution identified below, and the Contractor/financial institution identified below is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by California Department of General Services.

_____ _____

Date Contractor

By: _____ _____

Signature Title

_____

Federal Tax Identification Number

## CARB COMPLIANCE DECLARATION

**To:** _____

**Project:** _____

_____

CALIFORNIA AIR RESOURCES BOARD ("CARB") https://ww2.arb.ca.gov/

For any project awarded on or after January 1, 2024, Public Works Awarding Bodies are required to obtain valid CARB Certificates of Reported Compliance ("CRC") from all contractors and listed subcontractors before awarding the project. The Public Works Awarding Body will be required to retain CRCs for three years after the project is complete, and the CRCs are subject to CARB review upon five calendar days' notice.

The Regulations apply to all "Public Works Awarding Bodies," which phrase is broadly defined as "any public agency (state, county, city, school district, community college district, water district, sanitation district, transit district, etc.), or official thereof, in the state of California, that awards or enters into a contract for the erection, construction, alteration, repair, removal, or improvement of any public structure, building, road, or other public lands, property, or improvement of any kind."

The bidder must fully execute this document and submit it, including required attachments, with its bid for the above-captioned project. The bidder must submit the CRCs for the bidder and all of its subcontractors to this document within 7 calendar days of the bid opening.

The ARB Diesel Off-Road Online Reporting System (DOORS) reporting system is where the bidder and its subcontractors are able to obtain their CRCs: DOORS (ca.gov). There is also an additional website that provides them with more information on the regulation along with FAQs and user guides. The website for the "Off-Road Zone" is https://ww2.arb.ca.gov/our-work/programs/truckstop-resources/road-zone.

If any questions, please call the DOORS Hotline at 877-593-6677 or email doors@arb.ca.gov. Please note that at this time DOORS staff has limited access to documents received via mail and fax is unavailable.

Fact Sheet: Contracting Requirements | California Air Resources Board
https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-contracting-requirements

Fact Sheet: Renewable Diesel Fuel Requirements | California Air Resources Board
https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-renewable-diesel-fuel-requirements

Fact Sheet: Added Vehicle Restrictions and Tier Phase-Out Requirements | California Air Resources Board
https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-added-vehicle-restrictions-and-tier-phase-out-requirements

I, _____ [name of declarant], declare that I am the _____ [title] of _____ [name of bidding contractor], the entity making and submitting a bid for the above Project; that all CRCs required for _____ [name of bidding contractor] and its subcontractors on the above Project are attached to this declaration; that all of the attached CRCs are current and valid; and that the attached CRCs will allow the Owner to comply with the applicable CARB requirements in connection with the Project.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

_____ _____
Date Contractor

By: _____
Signature

**ROOF PROJECT CERTIFICATION**

Public Contract Code § 3006(a)(b)

**To:** _____

**Project:** _____

_____

I, _____[Bidder Name and Title], of _____ [Company], certify that I have not offered, given, or agreed to give, received, accepted, or agreed to accept, any gift, contribution, or any financial incentive whatsoever to or from any person in connection with the above-referenced Project contract. As used in this certification, "person" means any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Furthermore, I, _____ [Bidder Name and Title], of _____[Company], certify that I do not have, and throughout the duration of the contract, I will not have, any financial relationship in connection with the performance of this contract with any architect, engineer, roofing, consultant, materials manufacturer, distributor, or vendor that is not disclosed below.

I, _____ [Bidder Name and Title], of _____ [Company], have the following financial relationships, with an architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor, or other person in connection with the following roof project contract:

_____

[Name and address of building, contract date and number]

I certify that to the best of my knowledge, the contents of this disclosure are true, or are believed to be true.

Date: _____,20

Signature: _____

Print Name: _____

Print Name of Employer: _____

Insert DBVE Good Faith Efforts forms here

**END OF SECTION 00 4110**

**PRIME BIDDER CERTIFICATION OF DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION**

*To be completed by the Contractor Submitting a Lease-Leaseback Proposal.*



| **PART I – IDENTIFICATION INFORMATION** | | |
|---|---|---|
| BIDDER'S NAME | BUSINESS ADDRESS | TELEPHONE NUMBER |
| SCHOOL DISTRICT | COUNTY | APPLICATION NO. |

**PART II – METHOD OF COMPLIANCE WITH DVBE PARTICIPATION GOALS** – Include this form and any other applicable documents listed in this table with your bid/proposal. Read the three columns in the table below as sentences from left to right. Check the appropriate box to indicate your method of committing the contract dollar amount.

**NOTE:** *Architectural, engineering, environmental, land surveying or construction management firms must indicate their method of compliance by marking the appropriate box A, B, C, or D after selection by the District and before the contract is signed.*

| **YOUR BUSINESS ENTERPRISE** | **AND YOU** | **AND YOU** |
|---|---|---|
| **A.** ☐ *is Disabled Veteran owned and your forces, will perform at least 3 percent of this contract* | *will include a copy of your DVBE letter from the Office of Small Business and DVBE Services (OSDS).* | |
| **B.** ☐ *is Disabled Veteran owned* ***but is unable*** *to perform the 3 percent of this contract with your forces* | *will use DVBE subcontractors/ suppliers to bring the contract participation to at least 3 percent* | *will include a copy of each DVBE's letter from OSDS (including yours, if applicable).* |
| **C.** ☐ *is* ***not*** *Disabled Veteran owned* | *will use DVBE subcontractors/ suppliers for at least 3 percent of this contract* | |
| **D.** ☐ *is unable to meet the required participation goals* | *will complete a Good Faith Effort to obtain DVBE participation* | *will include the Prime Bidder's Good Faith Effort Worksheet.* |

**Note:** An Office of Small Business and DVBE Services (OSDS) letter must be attached for each DVBE participating in the contract. The DVBE letter is obtained by application through the OSDS and must be provided at the time of bid opening. If the letter is not provided, the bid may be deemed nonresponsive and may be ineligible for award of the contract.

*Continued on reverse side*

**PART III – DVBE DOLLAR PARTICIPATION OF BID/PROPOSAL –** *Architectural, engineering, environmental, land surveying or construction management firms complete this part* ***after*** *selection by the district and before the contract is signed.*

*Show deductive alternate(s) in parenthesis. For more alternates/base bids, use a separate page to show items.*

A. If your business enterprise is a DVBE, list in the appropriate column the total dollar amount of your bid to be performed by your own participation.

B. List all your DVBE subcontractors/suppliers. Enter in the appropriate column the dollar amount for each of your subcontractors/suppliers.

C. Enter the total of Lines A and B for each column.

D. Enter the dollar amount of the bid/proposal to be performed by **non**-DVBE firms. Note: This line is the sum of the prime and subcontractor(s) **non**-DVBE dollar participation.

E. Enter the sum of the column totals from Line C and Line D. Note: Please be aware that the final determination of DVBE compliance is made based on the contract amount resulting from the district's acceptance or rejection of alternates.

| | **BASE BID/PROPOSAL** | **ALTERNATE #1** | **ALTERNATE #2** | **ALTERNATE #3 OR BASE BID B** | **ALTERNATE #4 OR BASE BID C** | **ALTERNATE #5** (Modernization or Reconstruction Only) |
|---|---|---|---|---|---|---|
| A. Prime Bidder, *if DVBE (own participation)* | $ | $ | $ | $ | $ | $ |
| B. DVBE Subcontractor or Supplier | | | | | | |
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| C. Subtotal (A & B) | | | | | | |
| D. Non-DVBE | | | | | | |
| E. Total Bid | | | | | | |

## PRIME BIDDER GOOD FAITH EFFORT WORKSHEET

*This worksheet is to be used to assist the Contractor in meeting the 3% DVBE participation goal* 

| BIDDER'S NAME | BUSINESS ADDRESS | CONTACT PERSON |
|---|---|---|
| TELEPHONE NUMBER | OWNER | COUNTY |

### GENERAL INSTRUCTIONS:

This worksheet is to be used to assist you in meeting the 3 percent DVBE participation goal. If specific information is not provided for Parts I through III, you do not meet the test of the "Good Faith Effort" and cannot so certify. If you are qualifying based on a "Good Faith Effort" you must include this form with your bid/proposal to the Owner.

### PART I – CONTACTS

To identify DVBE subcontractors/suppliers for participation in your bid/proposal, contact must be made with each of the following categories. It is recommended that you contact several DVBE organizations.

| CATEGORY | TELEPHONE NUMBER | DATE CONTACTED | PERSON CONTACTED |
|---|---|---|---|
| 1. Owner | | | |
| | | | |
| 2. Office of Small Business and DVBE Services (OSDS). OSDS publishes a searchable list of Disabled Veteran Business Enterprises Internet address – http://www.bidsync.com/DPXBisCASB | (916) 375-4940 | | |
| | | | |
| 3. DVBE Organizations (*List*): | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 4. Write "recorded message" in this column, if applicable. | | | |

**PART II – ADVERTISEMENTS** *You must make at least two (2) advertisements, one (1) in a paper that focuses on DVBE and one (1) in a trade paper. Advertisements should be published at least 14 days prior to bid/proposal opening; if you cannot advertise 14 days prior, advertise as soon as possible and provide an explanation. (Advertisements must be published in time to allow for a reasonable response). Advertisements must include that your firm is seeking DVBE participation, the project name and location, your firm's name, your firm's contact person, and phone number.*

***Attach copies of advertisements to this form.***

| FOCUS/TRADE PAPER NAME | CHECK ONE | | DATE OF ADVERTISEMENT |
|---|---|---|---|
| | TRADE | FOCUS | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**PART III – DVBE SOLICITATIONS** *List DVBE subcontractors/suppliers that were invited to bid. Use the following instructions to complete the remainder of this section (read the three columns as a sentence from left to right). If you need additional space to list DVBE solicitations, please use a separate page and attach to this form.*

| IF THE DVBE….. | THEN….. | AND….. |
|---|---|---|
| Was selected to participate | Check "yes" in the "SELECTED" column, include the applicable dollar amount in Part III of the Prime Bidder Certification | Include a copy of their DVBE letter from OSBCR. |
| Was **not** selected to participate | Check "no" in the "SELECTED" column | State why in the "REASON NOT SELECTED" column. |
| Did not respond to your solicitation | Check the "NO RESPONSE" column | |

| DISABLED VETERANS BUSINESS ENTERPRISES CONTACTED | SELECTED | | REASON NOT SELECTED *This section must be completed* | NO RESPONSE |
|---|---|---|---|---|
| | YES | NO | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**IMPORTANT NOTE:**

Please be aware that certification of the "Good Faith Effort" may only be made if you fully complete Parts I, II, and III on both sides of this form. A copy of this form must be retained by you and may be subject to a future audit.

**CERTIFICATION**

I, _____ certify that I am the bidder's Chief Executive Officer and that I have made a diligent effort to ascertain the facts with regard to the representations made herein. In making this certification, I am aware of Section 12650 et seq. of the Government Code providing for the imposition of treble damages for making false claims.

SIGNATURE OF CHIEF EXECUTIVE OFFICER | DATE

## SECTION 00 5210 - FORM OF AGREEMENT

1. **GENERAL:** Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division I - Specification Sections, apply to this Section.

2. **AGREEMENT FORM:** The Agreement Form to be used for this project shall be the American Institute of Architects' Document A101, 2017 Edition.

3. **EXECUTION:** The selected Bidder/Contractor shall execute the Agreement Form as noted in Section 00 4110 - Bid Form under the heading "Conditions".

**END OF SECTION 00 5210**

# AIA® Document A101™ – 2017

## *Standard Form of Agreement Between Owner and Contractor* *where the basis of payment is a Stipulated Sum*

**AGREEMENT** made as of the day of in the year
*(In words, indicate day, month and year.)*

**BETWEEN** the Owner:
*(Name, legal status, address and other information)*

and the Contractor:
*(Name, legal status, address and other information)*

for the following Project:
*(Name, location and detailed description)*

The Architect:
*(Name, legal status, address and other information)*

The Owner and Contractor agree as follows.

**ADDITIONS AND DELETIONS:**
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

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4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

*(Paragraph Deleted)*

## ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

## ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

## ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

**§ 3.1** The date of commencement of the Work shall be:
*(Check one of the following boxes.)*

[ ] The date of this Agreement.

[ X ] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
*(Insert a date or a means to determine the date of commencement of the Work.)*

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

**§ 3.2** The Contract Time shall be measured from the date of commencement of the Work.

### § 3.3 Substantial Completion

**§ 3.3.1** Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:


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*(Check one of the following boxes and complete the necessary information.)*

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ ] By the following date:

**§ 3.3.2** Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

| Portion of Work | Substantial Completion Date |
|---|---|

**§ 3.3.3** If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

## ARTICLE 4 CONTRACT SUM

**§ 4.1** The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($ ), subject to additions and deductions as provided in the Contract Documents.

### § 4.2 Alternates

**§ 4.2.1** Alternates, if any, included in the Contract Sum:

| Item | Price |
|---|---|

**§ 4.2.2** Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
*(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

| Item | Price | Conditions for Acceptance |
|---|---|---|

**§ 4.3** Allowances, if any, included in the Contract Sum:
*(Identify each allowance.)*

| Item | Price |
|---|---|

**§ 4.4** Unit prices, if any:
*(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*

| Item | Units and Limitations | Price per Unit ($0.00) |
|---|---|---|

**§ 4.5** Liquidated damages, if any:
*(Insert terms and conditions for liquidated damages, if any.)*

**§ 4.5.1** Step One Liquidated Damages: Failure to complete the Project, or applicable phases of the Project, within the date(s) and in the manner provided for by the Contract Documents, shall subject the Contractor to liquidated damages for each calendar day by which such completion is delayed beyond the applicable Date for Completion. For purposes of liquidated damages, the concept of substantial completion shall not constitute completion and is not part of the Contract Documents. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer if the Project were not completed by the applicable Date for Completion are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages that the Owner would suffer if


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(3B9ADA08)

completion is delayed include, but are not limited to, loss of the use of the Project, disruption of activities, costs of administration, supervision and the incalculable inconvenience and loss suffered by the public. Accordingly, the Parties agree that the following dollar figure shall be the amount of damages which the Owner shall directly incur upon failure of the Contractor to complete the Project, or applicable parts thereof, within the time specified, **$1,000.00 for each calendar day** by which completion of the Project, or applicable parts thereof, is delayed beyond the Date for Completion as adjusted by change orders. If the Contractor becomes liable under this Section, the Owner, in addition to all other remedies provided by law, shall have the right to withhold all retained percentages of payments and/or progress payments, and to collect the interest thereon, which would otherwise be or become due the Contractor until the liability of the Contractor under this Article has been finally determined. If the retained percentages and withheld progress payments are not sufficient to discharge all liabilities of the Contractor incurred under this Section, then the Contractor and its sureties shall continue to remain liable to the Owner for such liabilities until all such liabilities are satisfied in full. If the Owner accepts any work or makes any payment under this Agreement after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any Agreement provisions regarding time of completion and liquidated damages.

**§ 4.5.2 Step Two Liquidated Damages:** Should the Contractor fail to complete and closeout this contract within 65 days of the Notice of Completion, pursuant to Government Code Section 53069.85, said Contractor shall forfeit and pay (or the Owner may deduct the amount thereof from any money due or to become due to the Contractor) the sum of **Two Hundred and Fifty Dollars ($250.00) for each calendar day** as Step Two Liquidated Damages, in addition to amounts which may be assessed for Step One liquidated damages.

**§ 4.6** Other:
*(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)*

## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

**§ 5.1.1** Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

**§ 5.1.2** The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

**§ 5.1.3** Provided that an Application for Payment is received by the Architect not later than the 25th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 25th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty ( 30 ) days after the Architect receives the Application for Payment.
*(Federal, state or local laws may require payment within a certain period of time.)*

**§ 5.1.4** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

**§ 5.1.5** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.


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**User Notes:** (3B9ADA08)

**§ 5.1.6** In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

**§ 5.1.6.1** The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

**§ 5.1.6.2** The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

**§ 5.1.7 Retainage**

**§ 5.1.7.1** For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

Five Percent ( 5 % )

**§ 5.1.7.1.1** The following items are not subject to retainage:
*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*

**§ 5.1.7.2** Reduction or limitation of retainage, if any, shall be as follows:
*(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)*

**§ 5.1.7.3** Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
*(Insert any other conditions for release of retainage upon Substantial Completion.)*

**§ 5.1.8** If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

**§ 5.1.9** Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.


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### § 5.2 Final Payment

**§ 5.2.1** Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

**.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

**.2** a final Certificate for Payment has been issued by the Architect.

**§ 5.2.2** The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

### § 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
*(Insert rate of interest agreed upon, if any.)*

12.00 % per annum

## ARTICLE 6 DISPUTE RESOLUTION

### § 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

### § 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
*(Check the appropriate box.)*

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[ X ] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

## ARTICLE 7 TERMINATION OR SUSPENSION

**§ 7.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

**§ 7.1.1** If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)*

**§ 7.2** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.


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## ARTICLE 8 MISCELLANEOUS PROVISIONS

**§ 8.1** Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

**§ 8.2** The Owner's representative:
*(Name, address, email address, and other information)*

**§ 8.3** The Contractor's representative:
*(Name, address, email address, and other information)*

**§ 8.4** Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

**§ 8.5 Insurance and Bonds**

**§ 8.5.1** The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

**§ 8.5.2** The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

**§ 8.6** Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
*(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

**§ 8.7** Other provisions:

§ 8.7.1 License Required: In accordance with Section 3300 of California Public Contract Code, the Contractor and all subcontractors are required by law to be licensed as regulated by the Contractors' State License Board, and shall maintain that license in good standing through Project completion and all applicable warranty periods. License classification required for this project is indicated in Specification Section 00 1110 - Instructions to Bidders.

§ 8.7.2 Indemnification and Insurance: The Contractor will defend, indemnify and hold harmless the Owner, its governing board, officers, agents, trustees, employees and others as provided in the General Conditions. By this statement the Contractor represents that it has secured the payment of Workers' Compensation in compliance with the provisions of the Labor Code of the State of California and during the performance of the work contemplated


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herein will continue so to comply with said provisions of said Code. The Contractor shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation. Contractor shall provide the insurance set forth in the General Conditions and Supplementary Conditions.

§ 8.7.3 Escrow Account in Lieu of Retention: In accordance with section 22300 of the Public Contract Code, the Owner will permit the substitution of securities for any retention monies withheld by the Owner to ensure performance under the Contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Owner, or with a state or federally chartered bank as the escrow agent, who shall then pay such retention monies to the Contractor. Upon completion of the Contract, the securities shall be returned to the Contractor if Owner has no basis to withhold under the Contract Documents. Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest-bearing, demand-deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the Owner. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon. Any escrow agreement entered by Owner and Contractor pursuant to Public Contract Code section 22300, shall be substantially similar to the form set forth in Public Contract Code section 22300.

§ 8.7.4 Wage Rates: The Project is a public work, the Work shall be performed as a public work, and under California Labor Code Section 1770 *et seq*., the Director of the California Department of Industrial Relations ("DIR") has determined the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which the work is to be performed, for each craft, classification or type of worker needed to execute this Contract. Per diem wages shall be deemed to include employer payments for health and welfare, pension, vacation, apprenticeship or other training programs, and similar purposes. Copies of the rates are on file at the Owner's principal office. The rate of prevailing wage for any craft, classification or type of workmanship to be employed on this Project is the rate established by the applicable collective bargaining agreement which rate so provided is hereby adopted by reference and shall be effective for the life of this Agreement or until the Director of the DIR determines that another rate be adopted. It shall be mandatory upon the Contractor and on any subcontractor to pay not less than the said specified rates to all workers employed in the execution of this Agreement. The Contractor and any subcontractor under the Contractor as a penalty to the Owner shall forfeit not more than Two Hundred Dollars ($200.00) for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed. The difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

§ 8.7.5 DIR Registration: The Owner will not accept any bid or enter into any contract without proof of the bidder's current registration to perform public work under Labor Code Section 1725.5. Bidders shall not accept any subbid or enter into any subcontract without proof of the subcontractor's current registration to perform public work under Labor Code Section 1725.5.

§ 8.7.6 Payroll Records: The Contractor and each Subcontractor shall keep or cause to be kept an accurate record for work on this Project showing the names, addresses, social security numbers, work classification, straight time and overtime hours worked and occupations of all laborers, workers and mechanics employed by them in connection with the performance of this Contract or any subcontract thereunder, and showing also the actual per diem wage paid to each of such workers, which records shall be open at all reasonable hours to inspection by the Owner, its officers and agents and to the representatives of the Division of Labor Standards Enforcement of the DIR. Contractor and all subcontractors shall comply with Labor Code section 1776. In accordance with Labor Code section 1771.4(a)(1), the Project is subject to compliance monitoring and enforcement by the DIR. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner on a monthly basis, unless directed by the Owner to furnish such records more often, and in the format prescribed by the Labor Commissioner.

§ 8.7.7 Subcontracting: Subcontracting under this Agreement shall be governed by the California "Subletting and Subcontracting Fair Practices Act", Public Contract Code Sections 4100-4114.

§ 8.7.8 Working Hours: In accordance with the provisions of Sections 1810 to 1815, inclusive, of the Labor Code of


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the State of California, which are hereby incorporated and made a part hereof, the time of service of any worker employed by the Contractor or a Subcontractor doing or contracting to do any part of the Work contemplated by this Agreement is limited and restricted to eight hours during any one calendar day and forty hours during any one calendar week, provided, that work may be performed by such employee in excess of said eight hours per day or forty hours per week provided that compensation for all hours worked in excess of eight hours per day, and forty hours per week, is paid at a rate not less than one and one-half (1½) times the basic rate of pay. The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by them in connection with the Work. The records shall be kept open at all reasonable hours to inspection by representatives of the Owner and the Division of Labor Law Enforcement. The Contractor shall as a penalty to the Owner forfeit Twenty-five Dollars ($25.00) for each worker employed in the execution of this Agreement by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day, and forty hours in any one calendar week, except as herein provided.

§ 8.7.9 California Code of Regulations Compliance: The Contractor shall comply with California Code of Regulations (CCR), Title 24, in addition to all other applicable regulations. Contractor shall keep a copy of the latest edition of Title 24, Part 1 through Part 5 and Part 9, on the job site at all times, and keep it available for reference use. Nothing in these contractor documents shall be construed to permit work not conforming to these codes. A copy of the stamped contract documents shall be kept on the job site and made available to the Owner's Inspector. Where the requirements of these Contract Documents exceed those of such codes or ordinances, these Contract Documents shall govern. The provisions of all applicable building codes and ordinances shall be considered a minimum requirement.

§ 8.7.10 Apprentices: The Contractor shall comply with California Labor Code Sections 1777.5 and 1777.6. These sections require that contractors and subcontractors employ apprentices in apprenticeable occupations in a ratio of not less than 1 hour of apprentice's work for each 5 hours of work performed by a journeyman (unless an exemption is granted in accordance with Section 1777.5) and that contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public works solely on the ground of sex, race, religious creed, national origin, ancestry or color. Only apprentices as defined in Labor Code Section 3077, who are in training under apprenticeship standards and who have signed written apprentice agreements, will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the Contractor for all apprenticeable occupations.

§ 8.7.11 DSA Oversight Process: The Contractor must comply with the applicable requirements of the Division of State Architect ("DSA") Construction Oversight Process ("DSA Oversight Process"), including but not limited to (a) notifying the Inspector of Record ("IOR") upon commencement and completion of each aspect of the work as required under DSA Form 156;, (b) coordinating the Work with the IOR's inspection duties and requirements; (c) submitting verified reports under DSA Form 6-C; and (d) coordinating with the Owner, Owner's Architect, any Construction Manager, any laboratories, and the IOR to meet the DSA Oversight Process requirements without delay or added costs to the Project. Contractor shall be responsible for any additional DSA fees related to review of proposed changes to the DSA-approved construction documents, to the extent the proposed changes were caused by Contractor's wrongful actions or omissions. If inspected work is found to be in non-compliance with the DSA-approved construction documents or the DSA-approved testing and inspection program, then it must be removed and corrected. Any construction that covers unapproved or uninspected work is subject to removal and correction, at Contractor's expense, in order to permit inspection and approval of the covered work in accordance with the DSA Oversight Process.

§ 8.7.12 Prequalification of Contractor and Certain Subcontractors: Owner has determined that the Project is subject to the requirements of Public Contract Code section 20111.6. Accordingly, the Owner has required that Contractor and all electrical, mechanical, and plumbing subcontractors to be utilized on the Project complete and submit to the Owner a standardized prequalification questionnaire and financial statement. The questionnaire and financial statement has been verified under oath by the prequalification applicants in the manner in which civil pleadings in civil actions are verified. The questionnaires and financial statements are not public records and are not open to public inspection. The Owner has adopted and applied a uniform system of rating the prequalification applicants on the basis of the completed questionnaires and financial statements. The questionnaire and financial statement, and the uniform system of rating applicants cover, at a minimum, the issues covered by the standardized questionnaire and model guidelines for rating bidders developed by the DIR pursuant to Public Contract Code section 20101(a).


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.1 If the Project includes electrical, mechanical, or plumbing components that will be performed by electrical, mechanical, or plumbing contractors, then a list of prequalified general contractors and electrical, mechanical, and plumbing subcontractors has been or will be made available by the Owner to all bidders at least five business days prior to the dates fixed for the receiving and opening of bids on the Project.

.2 In addition, each prospective contractor and electrical, mechanical, and plumbing subcontractor on the Project has been furnished by the Owner with a standardized proposal form that, when completed and executed, has been or will be submitted as his or her bid. Bids not presented on the forms so furnished shall be disregarded. A proposal form has not and will not be accepted from any person or other entity that is required to submit a completed questionnaire and financial statement for prequalification or from any person or other entity that uses a subcontractor that is required to submit a completed questionnaire and financial statement for prequalification, but has not done so at least 10 business days prior to the date fixed for the receiving and opening of bids on the Project or has not been prequalified for at least five business days prior to that date.

.3 For purposes of this Article, electrical, mechanical, and plumbing subcontractors are contractors licensed pursuant to Section 7058 of the California Business and Professions Code, specifically contractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and C-46 licenses, pursuant to regulations of the Contractors' State License Board.

§ 8.7.13 DVBE Goals: Compliance with Disabled Veteran Business Enterprise (DVBE) contracting goals is required for this Project. In accordance with Education Code section 17076.11 the Owner has a DVBE participation goal of 3% per year of the overall dollar amount of state funds allocated to the Owner pursuant to the Leroy F. Green School Facilities Act of 1998, and expended each year by the Owner for this Project. The Owner is seeking DVBE participation under this Agreement. The Contractor must make a good faith effort to contact and utilize DVBE subcontractors and suppliers in securing bids, in the manner set forth in this Article for performance of the Project. Information regarding certified DVBE firms can be obtained from the State's Office of Small Business and DVBE Services (OSDS) at (916) 375-4940 as well as the OSDS website at www.bidsync.com/DPXBisCASB. Verification of DVBE status must be obtained from the OSDS by receiving an approved certification letter and reference number from that office. Contractor is required, as a material condition of this Agreement, to retain documentation of its good faith efforts in utilizing DVBEs for this Project, for submission to the Owner or to the applicable state agency in the event such documentation is requested.

.1 Good faith efforts are demonstrated by evidence of the following: (a) contact was made with the Owner regarding the identification of DVBE; (b) contact was made with other state agencies and with local DVBE organizations to identify DVBEs; (c) advertising was published in trade papers and other papers focusing on DVBEs; (d) invitations to bid or proposal solicitations were submitted to potential DVBE contractors; and (e) available DVBEs were considered. Contractor shall certify, under penalty of perjury, that a good faith effort was made to include DVBE subcontractors and suppliers in the Project.

.2 Prior to, and as a condition precedent for the release of any retention withheld from Sublease payments made to Contractor by the Owner pursuant to Section 6 of the Sublease, the Contractor shall provide the Owner with written documentation identifying the amount paid to certified DVBE subcontractors and suppliers in performance of the Project. The Contractor shall also provide the Owner with a copy of the DVBE Certification Letter issued by OSDS for each DVBE that has participated in the Project. This documentation will be used by the Owner to evaluate its success in meeting its DVBE participation goal.

## ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

**§ 9.1** This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

*(Insert the date of the E203-2013 incorporated into this Agreement.)*

.5 Drawings: Drawing sheets as listed in the Drawing Index on Sheet G1.



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*(Table Deleted)*

**.6** Specifications: Divisions 00 through 34 as listed in the Project Manual Table of Contents.

*(Table Deleted)*

**.7** Addenda, if any:

| Number | Date | Pages |
|---|---|---|

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

**.8** Other Exhibits:
*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

*(Paragraphs Deleted)*

*(Table Deleted)*

[ X ] Supplementary and other Conditions of the Contract:

| Document | Title | Date | Pages |
|---|---|---|---|
| Section 00 7310 | Supplementary Conditions | | |

**.9** Other documents, if any, listed below:
*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

This Agreement entered into as of the day and year first written above.

| | |
|---|---|
| **OWNER** *(Signature)* | **CONTRACTOR** *(Signature)* |
| *(Printed name and title)* | *(Printed name and title)* |


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## *AIA® Document A101™ – 2017*

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

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**PAGE 2**

~~**EXHIBIT A INSURANCE AND BONDS**~~

...

[ X ] A date set forth in a notice to proceed issued by the Owner.

**PAGE 4**

§ **4.5.1** Step One Liquidated Damages: Failure to complete the Project, or applicable phases of the Project, within the date(s) and in the manner provided for by the Contract Documents, shall subject the Contractor to liquidated damages for each calendar day by which such completion is delayed beyond the applicable Date for Completion. For purposes of liquidated damages, the concept of substantial completion shall not constitute completion and is not part of the Contract Documents. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer if the Project were not completed by the applicable Date for Completion are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages that the Owner would suffer if completion is delayed include, but are not limited to, loss of the use of the Project, disruption of activities, costs of administration, supervision and the incalculable inconvenience and loss suffered by the public. Accordingly, the Parties agree that the following dollar figure shall be the amount of damages which the Owner shall directly incur upon failure of the Contractor to complete the Project, or applicable parts thereof, within the time specified, **$1,000.00 for each calendar day** by which completion of the Project, or applicable parts thereof, is delayed beyond the Date for Completion as adjusted by change orders. If the Contractor becomes liable under this Section, the Owner, in addition to all other remedies provided by law, shall have the right to withhold all retained percentages of payments and/or progress payments, and to collect the interest thereon, which would otherwise be or become due the Contractor until the liability of the Contractor under this Article has been finally determined. If the retained percentages and withheld progress payments are not sufficient to discharge all liabilities of the Contractor incurred under this Section, then the Contractor and its sureties shall continue to remain liable to the Owner for such liabilities until all such liabilities are satisfied in full. If the Owner accepts any work or makes any payment under this Agreement after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any Agreement provisions regarding time of completion and liquidated damages.

...

§ **4.5.2 Step Two Liquidated Damages:** Should the Contractor fail to complete and closeout this contract within 65 days of the Notice of Completion, pursuant to Government Code Section 53069.85, said Contractor shall forfeit and pay (or the Owner may deduct the amount thereof from any money due or to become due to the Contractor) the sum of **Two Hundred and Fifty Dollars ($250.00) for each calendar day** as Step Two Liquidated Damages, in addition to amounts which may be assessed for Step One liquidated damages.

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**§ 5.1.3** Provided that an Application for Payment is received by the Architect not later than the –25th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the ~~–day of the~~ –25th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ~~–(~~–Thirty ( 30 ) days after the Architect receives the Application for Payment.

**PAGE 5**

Five Percent ( 5 % )

**PAGE 6**

~~%~~ 12.00 % per annum

...

[ X ] Litigation in a court of competent jurisdiction

**PAGE 7**

§ 8.7.1 License Required: In accordance with Section 3300 of California Public Contract Code, the Contractor and all subcontractors are required by law to be licensed as regulated by the Contractors' State License Board, and shall maintain that license in good standing through Project completion and all applicable warranty periods. License classification required for this project is indicated in Specification Section 00 1110 - Instructions to Bidders.

**PAGE 8**

§ 8.7.2 Indemnification and Insurance: The Contractor will defend, indemnify and hold harmless the Owner, its governing board, officers, agents, trustees, employees and others as provided in the General Conditions. By this statement the Contractor represents that it has secured the payment of Workers' Compensation in compliance with the provisions of the Labor Code of the State of California and during the performance of the work contemplated herein will continue so to comply with said provisions of said Code. The Contractor shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation. Contractor shall provide the insurance set forth in the General Conditions and Supplementary Conditions.

...

§ 8.7.3 Escrow Account in Lieu of Retention: In accordance with section 22300 of the Public Contract Code, the Owner will permit the substitution of securities for any retention monies withheld by the Owner to ensure performance under the Contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Owner, or with a state or federally chartered bank as the escrow agent, who shall then pay such retention monies to the Contractor. Upon completion of the Contract, the securities shall be returned to the Contractor if Owner has no basis to withhold under the Contract Documents. Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest-bearing, demand-deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the Owner. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon. Any escrow agreement entered by Owner and Contractor pursuant to Public Contract Code section 22300, shall be substantially similar to the form set forth in Public Contract Code section 22300.

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...

§ 8.7.4 Wage Rates: The Project is a public work, the Work shall be performed as a public work, and under California Labor Code Section 1770 *et seq.*, the Director of the California Department of Industrial Relations ("DIR") has determined the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which the work is to be performed, for each craft, classification or type of worker needed to execute this Contract. Per diem wages shall be deemed to include employer payments for health and welfare, pension, vacation, apprenticeship or other training programs, and similar purposes. Copies of the rates are on file at the Owner's principal office. The rate of prevailing wage for any craft, classification or type of workmanship to be employed on this Project is the rate established by the applicable collective bargaining agreement which rate so provided is hereby adopted by reference and shall be effective for the life of this Agreement or until the Director of the DIR determines that another rate be adopted. It shall be mandatory upon the Contractor and on any subcontractor to pay not less than the said specified rates to all workers employed in the execution of this Agreement. The Contractor and any subcontractor under the Contractor as a penalty to the Owner shall forfeit not more than Two Hundred Dollars ($200.00) for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed. The difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

...

§ 8.7.5 DIR Registration: The Owner will not accept any bid or enter into any contract without proof of the bidder's current registration to perform public work under Labor Code Section 1725.5. Bidders shall not accept any subbid or enter into any subcontract without proof of the subcontractor's current registration to perform public work under Labor Code Section 1725.5.

...

§ 8.7.6 Payroll Records: The Contractor and each Subcontractor shall keep or cause to be kept an accurate record for work on this Project showing the names, addresses, social security numbers, work classification, straight time and overtime hours worked and occupations of all laborers, workers and mechanics employed by them in connection with the performance of this Contract or any subcontract thereunder, and showing also the actual per diem wage paid to each of such workers, which records shall be open at all reasonable hours to inspection by the Owner, its officers and agents and to the representatives of the Division of Labor Standards Enforcement of the DIR. Contractor and all subcontractors shall comply with Labor Code section 1776. In accordance with Labor Code section 1771.4(a)(1), the Project is subject to compliance monitoring and enforcement by the DIR. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner on a monthly basis, unless directed by the Owner to furnish such records more often, and in the format prescribed by the Labor Commissioner.

...

§ 8.7.7 Subcontracting: Subcontracting under this Agreement shall be governed by the California "Subletting and Subcontracting Fair Practices Act", Public Contract Code Sections 4100-4114.

**PAGE 9**

§ 8.7.8 Working Hours: In accordance with the provisions of Sections 1810 to 1815, inclusive, of the Labor Code of the State of California, which are hereby incorporated and made a part hereof, the time of service of any worker employed by the Contractor or a Subcontractor doing or contracting to do any part of the Work contemplated by this

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Agreement is limited and restricted to eight hours during any one calendar day and forty hours during any one calendar week, provided, that work may be performed by such employee in excess of said eight hours per day or forty hours per week provided that compensation for all hours worked in excess of eight hours per day, and forty hours per week, is paid at a rate not less than one and one-half (1½) times the basic rate of pay. The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by them in connection with the Work. The records shall be kept open at all reasonable hours to inspection by representatives of the Owner and the Division of Labor Law Enforcement. The Contractor shall as a penalty to the Owner forfeit Twenty-five Dollars ($25.00) for each worker employed in the execution of this Agreement by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day, and forty hours in any one calendar week, except as herein provided.

...

§ 8.7.9 California Code of Regulations Compliance: The Contractor shall comply with California Code of Regulations (CCR), Title 24, in addition to all other applicable regulations. Contractor shall keep a copy of the latest edition of Title 24, Part 1 through Part 5 and Part 9, on the job site at all times, and keep it available for reference use. Nothing in these contractor documents shall be construed to permit work not conforming to these codes. A copy of the stamped contract documents shall be kept on the job site and made available to the Owner's Inspector. Where the requirements of these Contract Documents exceed those of such codes or ordinances, these Contract Documents shall govern. The provisions of all applicable building codes and ordinances shall be considered a minimum requirement.

...

§ 8.7.10 Apprentices: The Contractor shall comply with California Labor Code Sections 1777.5 and 1777.6. These sections require that contractors and subcontractors employ apprentices in apprenticeable occupations in a ratio of not less than 1 hour of apprentice's work for each 5 hours of work performed by a journeyman (unless an exemption is granted in accordance with Section 1777.5) and that contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public works solely on the ground of sex, race, religious creed, national origin, ancestry or color. Only apprentices as defined in Labor Code Section 3077, who are in training under apprenticeship standards and who have signed written apprentice agreements, will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the Contractor for all apprenticeable occupations.

...

§ 8.7.11 DSA Oversight Process: The Contractor must comply with the applicable requirements of the Division of State Architect ("DSA") Construction Oversight Process ("DSA Oversight Process"), including but not limited to (a) notifying the Inspector of Record ("IOR") upon commencement and completion of each aspect of the work as required under DSA Form 156;, (b) coordinating the Work with the IOR's inspection duties and requirements; (c) submitting verified reports under DSA Form 6-C; and (d) coordinating with the Owner, Owner's Architect, any Construction Manager, any laboratories, and the IOR to meet the DSA Oversight Process requirements without delay or added costs to the Project. Contractor shall be responsible for any additional DSA fees related to review of proposed changes to the DSA-approved construction documents, to the extent the proposed changes were caused by Contractor's wrongful actions or omissions. If inspected work is found to be in non-compliance with the DSA-approved construction documents or the DSA-approved testing and inspection program, then it must be removed and corrected. Any construction that covers unapproved or uninspected work is subject to removal and correction, at Contractor's expense, in order to permit inspection and approval of the covered work in accordance with the DSA Oversight Process.

...

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§ 8.7.12 Prequalification of Contractor and Certain Subcontractors: Owner has determined that the Project is subject to the requirements of Public Contract Code section 20111.6. Accordingly, the Owner has required that Contractor and all electrical, mechanical, and plumbing subcontractors to be utilized on the Project complete and submit to the Owner a standardized prequalification questionnaire and financial statement. The questionnaire and financial statement has been verified under oath by the prequalification applicants in the manner in which civil pleadings in civil actions are verified. The questionnaires and financial statements are not public records and are not open to public inspection. The Owner has adopted and applied a uniform system of rating the prequalification applicants on the basis of the completed questionnaires and financial statements. The questionnaire and financial statement, and the uniform system of rating applicants cover, at a minimum, the issues covered by the standardized questionnaire and model guidelines for rating bidders developed by the DIR pursuant to Public Contract Code section 20101(a).

**PAGE 10**

**.1** If the Project includes electrical, mechanical, or plumbing components that will be performed by electrical, mechanical, or plumbing contractors, then a list of prequalified general contractors and electrical, mechanical, and plumbing subcontractors has been or will be made available by the Owner to all bidders at least five business days prior to the dates fixed for the receiving and opening of bids on the Project.

...

**.2** In addition, each prospective contractor and electrical, mechanical, and plumbing subcontractor on the Project has been furnished by the Owner with a standardized proposal form that, when completed and executed, has been or will be submitted as his or her bid. Bids not presented on the forms so furnished shall be disregarded. A proposal form has not and will not be accepted from any person or other entity that is required to submit a completed questionnaire and financial statement for prequalification or from any person or other entity that uses a subcontractor that is required to submit a completed questionnaire and financial statement for prequalification, but has not done so at least 10 business days prior to the date fixed for the receiving and opening of bids on the Project or has not been prequalified for at least five business days prior to that date.

...

**.3** For purposes of this Article, electrical, mechanical, and plumbing subcontractors are contractors licensed pursuant to Section 7058 of the California Business and Professions Code, specifically contractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and C-46 licenses, pursuant to regulations of the Contractors' State License Board.

...

§ 8.7.13 DVBE Goals: Compliance with Disabled Veteran Business Enterprise (DVBE) contracting goals is required for this Project. In accordance with Education Code section 17076.11 the Owner has a DVBE participation goal of 3% per year of the overall dollar amount of state funds allocated to the Owner pursuant to the Leroy F. Green School Facilities Act of 1998, and expended each year by the Owner for this Project. The Owner is seeking DVBE participation under this Agreement. The Contractor must make a good faith effort to contact and utilize DVBE subcontractors and suppliers in securing bids, in the manner set forth in this Article for performance of the Project. Information regarding certified DVBE firms can be obtained from the State's Office of Small Business and DVBE Services (OSDS) at (916) 375-4940 as well as the OSDS website at www.bidsync.com/DPXBisCASB. Verification of DVBE status must be obtained from the OSDS by receiving an approved certification letter and reference number from that office. Contractor is required, as a material condition of this Agreement, to retain documentation of its good faith efforts in utilizing DVBEs for this Project, for submission to the Owner or to the applicable state agency in the event such documentation is requested.

...

**.1** Good faith efforts are demonstrated by evidence of the following: (a) contact was made with the Owner regarding the identification of DVBE; (b) contact was made with other state agencies and with local

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DVBE organizations to identify DVBEs; (c) advertising was published in trade papers and other papers focusing on DVBEs; (d) invitations to bid or proposal solicitations were submitted to potential DVBE contractors; and (e) available DVBEs were considered. Contractor shall certify, under penalty of perjury, that a good faith effort was made to include DVBE subcontractors and suppliers in the Project.

...

.2 Prior to, and as a condition precedent for the release of any retention withheld from Sublease payments made to Contractor by the Owner pursuant to Section 6 of the Sublease, the Contractor shall provide the Owner with written documentation identifying the amount paid to certified DVBE subcontractors and suppliers in performance of the Project. The Contractor shall also provide the Owner with a copy of the DVBE Certification Letter issued by OSDS for each DVBE that has participated in the Project. This documentation will be used by the Owner to evaluate its success in meeting its DVBE participation goal.

...

.5 ~~Drawings~~Drawings: Drawing sheets as listed in the Drawing Index on Sheet G1.

**PAGE 11**

~~**Number** **Title** **Date**~~

...

.6 ~~Specifications~~Specifications: Divisions 00 through 34 as listed in the Project Manual Table of Contents.

...

~~**Section** **Title** **Date** **Pages**~~

...

~~[ ] AIA Document E204™ 2017, Sustainable Projects Exhibit, dated as indicated below:~~

...

~~(Insert the date of the E204 2017 incorporated into this Agreement.)~~

...

~~[ ] The Sustainability Plan:~~

...

~~**Title** **Date** **Pages**~~

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...

[ X ] Supplementary and other Conditions of the Contract:

...

| | |
|---|---|
| Section 00 7310 | Supplementary Conditions |

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# *Certification of Document's Authenticity*

*AIA® Document D401™ – 2003*

I, James Ryan Morrelli, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 14:22:27 on 10/11/2018 under Order No. 2470530043 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ - 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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## SECTION 00 5260 - ESCROW AGREEMENT

**1.** **GENERAL:** Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division I - Specification Sections, apply to this Section.

**2.** **ESCROW AGREEMENT FORM:** The Escrow Agreement form to be used for this project shall be the "Escrow Agreement for security deposits in lieu of Retention" included in this section.

**END OF SECTION 00 5260**

**ESCROW AGREEMENT FOR**
**SECURITY DEPOSITS IN LIEU OF RETENTION**

This is a fiduciary account created by statute, Public Contract Code section 22300. The funds deposited in this account shall not be released to Contractor or any other person or entity, other than Owner, including pursuant to any purported lien or writ of attachment or execution, without the prior written, express approval of Owner.

This Escrow Agreement is made and entered into by and between _____ School District, whose address is _____ ("Owner"),_____, whose address is _____ ("Contractor"); and _____, a state or federally chartered bank in California whose address is _____ ("Escrow Agent").

For the consideration hereinafter set forth, the Owner, Contractor, and Escrow Agent agree as follows:

1. Pursuant to California Public Contract Code section 22300, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by the Owner pursuant to the Contract entered into between the Owner and Contractor in the amount of _____ Dollars ($_____), and dated _____, ____, (the "Contract"). Alternatively, on written request of the Contractor, the Owner shall make payments of the retention earnings directly to the Escrow Agent. When Contractor deposits the securities as a substitute for retention earnings, the Escrow Agent shall notify the Owner within ten (10) calendar days of the deposit. The market value of the securities at the time of the substitution, as valued by the Owner, shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract. If the Owner determines that the securities are not adequate it will notify Contractor and Escrow Agent, and Contractor shall deposit additional security as further determined by the Owner. Securities shall be held in the name of the Owner and shall designate the Contractor as the beneficial Owner.

2. Thereafter, Owner shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract, provided that the Escrow Agent holds securities in the form and amount specified above.

3. Pursuant to Public Contract Code section 22300, as an alternative to the procedures set forth above, Contractor may request in writing that the Owner pay retention amounts directly to Escrow Agent. When the Owner makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for benefit of the Contractor until such time as the escrow created under this Escrow Agreement is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the Escrow Agent directly.

4. The Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the Owner. These expenses and payment terms shall be determined by the Owner, Contractor and Escrow Agent.

5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.

6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from Owner to the Escrow Agent that Owner consents to the withdrawal of the amount sought to be withdrawn by Contractor.

7. The Owner shall have the right to draw upon the securities or any amount paid directly to Escrow Agent in the event of default of the Contract by the Contractor. Upon seven (7) days written notice to the Escrow Agent from the Owner of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash, including any amounts paid directly to Escrow Agent pursuant to Section 3 above, as instructed by Owner. Escrow Agent shall not be concerned with the validity of any notice of default given by Owner pursuant to this paragraph, and shall promptly comply with Owner's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to a conflicting demand and waives any present or future opportunity of interpleader.

8. Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payment of fees and charges.

9. Escrow Agent shall rely on the written notifications from the Owner and Contractor pursuant to Sections (4), (5), (6), (7) and (8) of this Agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

10. Pursuant to Public Contract Code §22300, Contractor shall pay to each subcontractor, not later than 20 days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the Contractor.

11. Securities eligible for investment under this Agreement, as provided by Public Contract Code §22300, shall be those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and Owner.

12. The Contractor shall indemnify and hold harmless the Owner, and the Owner's agents and employees, from and against all liability, claims, actions, costs, damages or losses of any kind, including but not limited to attorney's fees, arising out of or resulting from any loss due to reduction of interest earnings or value of securities, or by reason of any delinquency, negligence, or default of escrow agent.

13. The venue of any litigation concerning the rights and obligations of the parties to this agreement shall be the County of Tulare and the removal provisions of Code of Civil Procedure Section 394 shall not apply to any such litigation.

14. The names of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner, the Contractor, and the Escrow Agent in connection with the foregoing, and exemplars of their respective signatures are as follows:

| **ON BEHALF OF OWNER** | **ON BEHALF OF CONTRACTOR** | **ON BEHALF OF ESCROW AGENT** |
|---|---|---|
| Signature | Signature | Signature |
| Typewritten Name | Typewritten Name | Typewritten Name |
| Title | Title | Title |

In Witness Whereof, the parties have executed this Agreement by their proper officers on the date first set forth above.

| **OWNER** | **CONTRACTOR** | **ESCROW AGENT** |
|---|---|---|
| Signature | Signature | Signature |
| Typewritten Name | Typewritten Name | Typewritten Name |
| Title | Title | Title |

*At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.*

**SECTION 00 6100 - BOND FORMS**

**1.** **GENERAL:** Contractor shall pay for and maintain the required bonds during the terms specified.

**2.** **PERFORMANCE / PAYMENT BOND:** Performance / Payment Bond shall be submitted with the Agreement Form in the amount of 100% percent of the Contract Price and shall guarantee the Faithful Performance of the Contract, and shall insure the Owner during the life of the Contract, and for the term of any warranties or guarantees specified, and shall guarantee the payment in full of all claims for labor and material in accordance with the provisions of Sections 3247 and 3248 of the Civil Code.

**3.** **BOND FORMS:** Bonds to be used on this project shall be the American Institute of Architects Documents listed below, or bond forms that conform to applicable provisions of the California Civil Code, issued by a corporation duly and legally licensed to transact business in the State of California, and provided by an admitted surety insurer.

| | |
|---|---|
| Bid Bond | AIA Document A310 (2010) |
| Performance / Payment Bond | Bond forms attached to this Section |

The Contractor shall provide a minimum of four wet-signature copies of the Performance Bond and the Labor and Material Payment Bond to satisfy the needs of the Owner, the County Recorder, and other governmental agencies.

**END OF SECTION 00 6100**

**PROJECT PAYMENT BOND**
(Civil Code § 9550 et seq.)

_____ (the "Owner" of the public works project described below) and _____[CONTRACTOR'S BUSINESS NAME] (the "Principal") have entered into a Contract, the terms of which are incorporated herein by reference, dated _____, 2023 for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to construct the_____ [NAME OF PROJECT], at _____[PROJECT ADDRESS], [COUNTY NAME] COUNTY, CALIFORNIA. The Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the Owner to secure the claims arising under said Contract.

The Principal and the undersigned _____("Surety") are held and firmly bound unto all laborers, material men, and other persons, and bound for all amounts due, referred to in Civil Code section 9554, subdivision (b), in the sum of _____ Dollars ($_____) which sum well and truly be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by this payment bond.

The condition of this obligation is that if the said Principal or any of its subcontractors, or the heirs, executors, administrators, successors, or assigns of any of them, shall fail to pay any of the persons named in Civil Code section 9100, or any of the amounts due, as specified in Civil Code section 9554, subdivision (b), that said Surety will pay the same in an amount not exceeding the sum shown above, and also in case suit is brought upon this bond, will pay costs and reasonable attorney's fees to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment rendered. It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force. The Surety, for value received, stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, to the Work to be performed under the Contract, or to the specifications of the Contract, shall in any manner affect its obligations on this bond, and it waives notice of any such change, extension, alteration, or addition.

(To be signed by )
(Principal and Surety, )
(and acknowledged and )
(Notarial Seal attached )

_____
Principal
_____

_____
Surety

By: _____
Attorney-in-Fact

_____

The above bond is accepted and approved on _____, 20

**PROJECT PERFORMANCE BOND**

We [CONTRACTOR'S BUSINESS NAME], as Principal, and _____ as Surety, are held and firmly bound unto _____[OWNER NAME], in the County of [NAME], State of California (the "Owner") in the sum of $_____ for the payment of which sum well and truly made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, to the Owner for the full performance of a certain contract with the Owner, the terms of which are incorporated herein by reference, dated , 2023, for construction of a public work project described as_____ _____[NAME OF PROJECT], at _____[PROJECT ADDRESS], [COUNTY NAME] County, California.

The condition of this obligation is such that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions thereof that may be granted by the Owner, with or without notice to the Surety, and for the period of time specified in said Contract after completion for correction of faulty or improper materials and workmanship and during the life of any guarantee or warranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of all duly authorized modifications of said Contract that may hereafter be made, then this obligation is to be void, otherwise to remain in full force.

The Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, to the Work to be performed under the Contract, or to the specifications of the Contract, shall in any way affect its obligation on this bond, and it waives notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the Work, or to the specifications.

No further agreement between Surety and Owner shall be required as a prerequisite to the Surety performing its obligations under this bond.

(To be signed by Principal and )
(Surety, and acknowledged )
and Notarial Seal attached)
(Affix Corporate Seal)
(Affix Corporate Seal)
(Affix Corporate Seal)

_____
(Individual Principal)
_____
(Business Address)
_____
(Corporate Principal)
_____
(Business Address)
_____
(Corporate Surety)
_____
(Business Address)

By:_____

_____

The rate of premium on this bond is _____ per thousand.

The total amount of premium charged is _____.

The above must be filled in by Corporate Surety.

# AIA® Document A310™ – 2010

## *Bid Bond*

**CONTRACTOR:**
*(Name, legal status and address)*

**SURETY:**
*(Name, legal status and principal place of business)*

**OWNER:**
*(Name, legal status and address)*

**BOND AMOUNT:** $

**PROJECT:**
*(Name, location or address, and Project number, if any)*

**ADDITIONS AND DELETIONS:**
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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

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Signed and sealed this day of ,

| | |
|---|---|
| | *(Contractor as Principal)* *(Seal)* |
| *(Witness)* | *(Title)* |
| | *(Surety)* *(Seal)* |
| *(Witness)* | *(Title)* |

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*AIA® Document D401™ – 2003*

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_____

*(Signed)*

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*(Title)*

_____

*(Dated)*

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## SECTION 00 7210 - GENERAL CONDITIONS

1. **GENERAL CONDITIONS:** The General Conditions form to be used for this Project shall be the American Institute of Architects' Document A201, General Conditions of the Contract for Construction, 2017 Edition.

2. **REFERENCE COPY:** If the above referenced Document is not bound herein following this page, a copy may be obtained or referred to at the office of the Architect.

3. **MODIFICATIONS:** Refer to Section 00 7310 - Supplementary Conditions, for modifications, deletions, and supplements to the above General Conditions Form.

**END OF SECTION 00 7210**

# AIA® Document A201™ – 2017

## *General Conditions of the Contract for Construction*

**for the following PROJECT:**
*(Name and location or address)*

**THE OWNER:**
*(Name, legal status and address)*

**THE ARCHITECT:**
*(Name, legal status and address)*

**ADDITIONS AND DELETIONS:**
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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

**Language struck out is deleted by Section 00 7310 – Supplementary Conditions.**
**Language added by Section 00 7310 – Supplementary Conditions is noted thus - ++**

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15 CLAIMS AND DISPUTES


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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

#### § 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. ++

#### § 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

#### § 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### § 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

#### § 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### § 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### § 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

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### § 1.2 Correlation and Intent of the Contract Documents

**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. ++

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**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

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### § 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### § 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### § 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

**§ 1.5.1** ++

*(Paragraph Deleted)*

### § 1.6 Notice

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

### § 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

### § 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.


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## ARTICLE 2 OWNER

### § 2.1 General

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein. ++

### § 2.2 Evidence of the Owner's Financial Arrangements

**§ 2.2.1** Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

**§ 2.2.2** Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

**§ 2.2.3** After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.4** Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### § 2.3 Information and Services Required of the Owner

**§ 2.3.1** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

**§ 2.3.2** The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

**§ 2.3.3** If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

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**§ 2.3.4** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

**§ 2.3.5** The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

**§ 2.3.6** ++

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### § 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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## ARTICLE 3 CONTRACTOR

### § 3.1 General

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

**§ 3.1.2** The Contractor shall perform the Work in accordance with the Contract Documents.

**§ 3.1.3** The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

### § 3.2 Review of Contract Documents and Field Conditions by Contractor

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.


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**§ 3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. 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 in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

**§ 3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 Supervision and Construction Procedures

**§ 3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

### § 3.4 Labor and Materials

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

**§ 3.4.2** Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.


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**§ 3.4.3** The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

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### § 3.5 Warranty

**§ 3.5.1** The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that 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. Work, materials, or equipment not conforming to these requirements may be considered defective. 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. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**§ 3.5.2** All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### § 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

**§ 3.7.1** Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

**§ 3.7.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

**§ 3.7.3** If the Contractor performs Work contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

### § 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but


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shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

**§ 3.8 Allowances**

**§ 3.8.1** The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

**§ 3.8.2**

*(Paragraphs Deleted)*

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**§ 3.8.3** Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

**§ 3.9 Superintendent**

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

**§ 3.9.3** The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

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**§ 3.10 Contractor's Construction and Submittal Schedules**

**§ 3.10.1** The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

**§ 3.10.2** The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

**§ 3.10.3** The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

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### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### § 3.12 Shop Drawings, Product Data and Samples

**§ 3.12.1** Shop Drawings are 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.

**§ 3.12.2** Product Data are 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.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

**§ 3.12.4** 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. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of


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the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. 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 such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

**§ 3.12.10.2** If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

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### § 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

### § 3.14 Cutting and Patching

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### § 3.15 Cleaning Up

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

### § 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.


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### § 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

### § 3.18 Indemnification

**§ 3.18.1** ++

**§ 3.18.2** ++

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## ARTICLE 4 ARCHITECT

### § 4.1 General

**§ 4.1.1** The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

**§ 4.1.2** Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

### § 4.2 Administration of the Contract

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

**§ 4.2.2** 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, and 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. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. 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, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### § 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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**§ 4.2.5** Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

**§ 4.2.6** The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

**§ 4.2.7** The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such 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, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

**§ 4.2.8** The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

**§ 4.2.9** The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

**§ 4.2.10** If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

**§ 4.2.11** The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

**§ 4.2.12** Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

**§ 4.2.13** The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

**§ 4.2.14** The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.


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## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

**§ 5.1.1** A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

**§ 5.1.2** A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### § 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

**§ 5.2.1** ++

**§ 5.2.2** ++

**§ 5.2.3** ++

**§ 5.2.4** ++

### § 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

### § 5.4 Contingent Assignment of Subcontracts

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

**§ 5.4.3** Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

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## ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

### § 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

**§ 6.1.1** The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

**§ 6.1.2** When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

**§ 6.1.4** Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

### § 6.2 Mutual Responsibility

**§ 6.2.1** The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

**§ 6.2.4** The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

**§ 6.2.5** The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### § 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

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## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

**§ 7.1.1** Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

**§ 7.1.2** A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

**§ 7.1.3** Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### § 7.2 Change Orders

**§ 7.2.1** A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

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### § 7.3 Construction Change Directives

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

**§ 7.3.4** If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;


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.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

**§ 7.3.5** If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

**§ 7.3.6** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**§ 7.3.7** A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**§ 7.3.8** 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.

**§ 7.3.9** 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. The 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. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

**§ 7.3.10** When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

## ARTICLE 8 TIME

### § 8.1 Definitions

**§ 8.1.1** Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

**§ 8.1.2** The date of commencement of the Work is the date established in the Agreement.

**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8. ++

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**§ 8.1.4** The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.



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### § 8.2 Progress and Completion

**§ 8.2.1** Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

**§ 8.2.2** The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

**§ 8.2.3** The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

### § 8.3 Delays and Extensions of Time

**§ 8.3.1** If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15.

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

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## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

**§ 9.1.1** 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.

**§ 9.1.2** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### § 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

### § 9.3 Applications for Payment

**§ 9.3.1** At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.


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**§ 9.3.1.2** 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.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

### § 9.4 Certificates for Payment

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

### § 9.5 Decisions to Withhold Certification

**§ 9.5.1** The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;


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.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

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**§ 9.5.2** When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

**§ 9.5.3** When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

**§ 9.5.4** If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

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**§ 9.6 Progress Payments**

**§ 9.6.1** After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

**§ 9.6.2** The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

**§ 9.6.3** The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

**§ 9.6.4** The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

**§ 9.6.5** The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

**§ 9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

**§ 9.6.7** Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

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**§ 9.6.8** Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

### § 9.7 Failure of Payment

*(Paragraph Deleted)*

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### § 9.8 Substantial Completion

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof 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.

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

### § 9.9 Partial Occupancy or Use

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.


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**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work .

**§ 9.10 Final Completion and Final Payment**

**§ 9.10.1** Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

**§ 9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

**§ 9.10.5** Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

### § 10.2 Safety of Persons and Property

**§ 10.2.1** The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

**§ 10.2.2** The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

**§ 10.2.3** The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

**§ 10.2.4** When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

### § 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

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### § 10.3 Hazardous Materials and Substances

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily


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injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

**§ 10.3.2** Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

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### § 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

## ARTICLE 11 INSURANCE AND BONDS++


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## ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

### § 12.1 Uncovering of Work

**§ 12.1.1** If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

### § 12.2 Correction of Work

### § 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

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### § 12.2.2 After Substantial Completion

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. 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. If the Contractor fails to correct nonconforming Work within

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a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

**§ 12.2.2.2** The one-year period for correction of Work shall be 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.

**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

**§ 12.2.4** 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.

**§ 12.2.5** Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

++

### § 12.3 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 effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

*(Paragraph Deleted)*

++

### § 13.2 Successors and Assigns

**§ 13.2.1** The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.2.2** The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

### § 13.3 Rights and Remedies

**§ 13.3.1** Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

**§ 13.3.2** No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.


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**§ 13.4 Tests and Inspections**

**§ 13.4.1** ++

**§ 13.4.2** ++

*(Paragraph Deleted)*

**§ 13.4.4** ++

**§ 13.4.5** If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

**§ 13.4.6** Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

**§ 13.5 Interest**

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

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**ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT**

**§ 14.1 Termination by the Contractor**

**§ 14.1.1**

*(Paragraphs Deleted)*

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**§ 14.1.2** The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

**§ 14.1.3** If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

**§ 14.1.4** If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

**§ 14.2 Termination by the Owner for Cause**

**§ 14.2.1**


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*(Paragraphs Deleted)*

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**§ 14.2.2** When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

**§ 14.2.3** When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

**§ 14.2.4** If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

**§ 14.3 Suspension by the Owner for Convenience**

**§ 14.3.1** The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

**§ 14.3.2** The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

**§ 14.4 Termination by the Owner for Convenience**

**§ 14.4.1** The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

**§ 14.4.2** Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

**ARTICLE 15** ++

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## *AIA® Document A201™ – 2017*

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**PAGE 1**

**Language struck out is deleted by Section 00 7310 – Supplementary Conditions.**

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**Language added by Section 00 7310 – Supplementary Conditions is noted thus - ++**

**PAGE 3**

**15 CLAIMS AND**

...

~~**INDEX**~~**DISPUTES**

...

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The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. ~~Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.~~++

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**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent

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consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. ++

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**§ 1.5.1** ~~The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.~~++

...

~~**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.~~

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**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein. ++

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**§ 2.3.6** ~~Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.~~++

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**§ 3.7.3** If the Contractor performs Work ~~knowing it to be~~ contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

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**§ 3.8.2** ~~Unless otherwise provided in the Contract Documents,~~

...

~~.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;~~

...

~~.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and~~

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~~.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.~~

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**§ 3.18.1** ~~To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or~~

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~~anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.~~ ++

...

**§ 3.18.2** ~~In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.~~ ++

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**§ 5.2.1** ~~Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.~~ ++

...

**§ 5.2.2** ~~The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.~~ ++

...

**§ 5.2.3** ~~If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.~~ ++

...

**§ 5.2.4** ~~The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.~~ ++

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**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8. ++

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~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.~~

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**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work ~~not complying with the requirements of the Contract Documents.~~.

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**ARTICLE 11 INSURANCE AND ~~BONDS~~BONDS++**

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**~~§ 11.1 Contractor's Insurance and Bonds~~**

...

~~**§ 11.1.1** The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.~~

...

~~**§ 11.1.2** The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.~~

...

~~**§ 11.1.3** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.~~

...

~~**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.~~

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**§ 11.2 Owner's Insurance**

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§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

...

**§ 11.2.2 Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

...

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

...

**§ 11.3 Waivers of Subrogation**

...

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for

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damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

...

**§ 11.3.2** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

...

**§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance**

...

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

...

**§11.5 Adjustment and Settlement of Insured Loss**

...

**§ 11.5.1** A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

...

**§ 11.5.2** Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the

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~~Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.~~

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**PAGE 33**

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~~The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~

...

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**PAGE 34**

**§ 13.4.1** ~~Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.~~++

...

**§ 13.4.2** ~~If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.~~++

...

**§ 13.4.3** ~~If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary~~

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~~by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.~~

...

**§ 13.4.4** ~~Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.~~ ++

...

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...

**§ 14.1.1** ~~The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:~~

...

~~.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;~~

...

~~.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;~~

...

~~.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or~~

...

~~.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.~~

...

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...

**§ 14.2.1** ~~The Owner may terminate the Contract if the Contractor~~

**PAGE 35**

~~.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;~~

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...

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

...

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

...

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

...

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...

**ARTICLE 15 CLAIMS AND DISPUTES++**

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**§ 15.1 Claims**

...

**§ 15.1.1 Definition**

...

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

...

**§ 15.1.2 Time Limits on Claims**

...

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

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...

~~§ 15.1.3 Notice of Claims~~

...

~~§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.~~

...

~~§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.~~

...

~~§ 15.1.4 Continuing Contract Performance~~

...

~~§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.~~

...

~~§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.~~

...

~~§ 15.1.5 Claims for Additional Cost~~

...

~~If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.~~

...

~~§ 15.1.6 Claims for Additional Time~~

...

~~§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.~~

...

~~§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.~~

...

~~§ 15.1.7 Waiver of Claims for Consequential Damages~~

...

~~The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes~~

...

~~.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and~~

...

~~.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.~~

...

~~This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.~~

...

~~§ 15.2 Initial Decision~~

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~~§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.~~

...

~~§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.~~

...

~~§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.~~

...

~~§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.~~

...

~~§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.~~

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...

~~§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.~~

...

~~§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~

...

~~§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.~~

...

~~§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.~~

...

~~**§ 15.3 Mediation**~~

...

~~§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.~~

...

~~§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~

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~~§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.~~

...

~~§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.~~

...

**~~§ 15.4 Arbitration~~**

...

~~§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~

...

~~§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.~~

...

~~§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

...

~~§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

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~~§ 15.4.4 Consolidation or Joinder~~

...

~~§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).~~

...

~~§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~

...

~~§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.~~

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*AIA® Document D401™ – 2003*

I, James Ryan Morrelli, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 17:42:35 on 02/01/2018 under Order No. 1526130616 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ - 2017, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

*(Signed)*

_____

*(Title)*

_____

*(Dated)*

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**SECTION 00 7310 - SUPPLEMENTARY CONDITIONS**

**MODIFICATION OF GENERAL CONDITIONS:** The following provisions modify, delete or supplement the General Conditions, Section 00 7210. All Section numbers refer to the AIA Document A201 - 2017, General Conditions of the Contract for Construction. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

**1.1.1 Delete** the last sentence and **substitute** the following:

The Contract Documents shall include other documents included in Division 0, including the Invitation to Bid, the Instructions to Bidders, Bid Scopes, Preliminary Schedules, Information Available to Bidders, Bid Form, Fingerprinting Requirements, and portions of Addenda relating to these documents.

**Add the following Definitions, new Sections 1.1.9 through 1.1.22:**

**1.1.9 Abbreviations:** In the interest of brevity, the Specifications are written in an abbreviated form and may not include complete sentences. Omission of words or phrases such as "Contractor shall," "shall be," etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

**1.1.10 Addenda:** Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda only to the extent specified.

**1.1.11 As Shown, Etc:** Where "as shown," "as indicated," "as detailed," or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed," "as required," "as permitted," "as authorized," "as accepted," "as selected," or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance, or selection by Architect is intended unless otherwise stated.

**1.1.12 Deferred Approvals:** The requirements approved by the governing jurisdiction on any item submitted as a deferred approval in accordance with Title 24, California Code of Regulations, shall take precedence over any previously issued addenda, drawing, or specification.

**1.1.13 Division 1:** Sections of Division 1 - General Requirements govern the execution of the work of all sections of the specifications.

**1.1.14 General Conditions:** The General Conditions and any supplementary general conditions are a part of each and every section of the Specifications.

**1.1.15 Metric:** The Specifications may indicate metric units of measurement as a supplement to US customary units. When indicated thus: 1" (25 mm), the US customary unit is specific, and the metric unit is nonspecific. When not shown with parentheses, the unit is specific. The metric units correspond to the "International System of Units" (SI) and generally follow ASTM E 380, "Standard for Metric Practice."

**1.1.16 Plural:** Words in the singular shall include the plural whenever applicable or the context so indicates.

**1.1.17 Project Communications:** Routine written communications between the Architect and the Contractor, including documentation of telephone conversations, shall be in letter, field memo, or fax format. Such communications shall not be identified as Requests for Information nor shall they substitute for any other written requirement pursuant to the provisions of these Contract Documents.

**1.1.18 Provide:** "Provide" means "provided complete in place," that is, furnished, installed, tested, and ready for operation and use.

**1.1.19 Standard Specifications:** Any reference to standard specifications of any society, institute, association, or governmental authority is a reference to the organization's standard specifications, which are in effect as of the date the Notice to Bidders is first published. If applicable specifications are revised prior to completion of any part of the Work, the Contractor may, if acceptable to Architect, perform such Work in accordance with the revised specifications. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. Architect will furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.

**1.1.20 Titles:** The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved.

**1.1.21 Or:** "Or" shall include "and/or."

**1.1.22 Completion:** Statutory definitions of "completion" and "complete" shall apply for those statutory purposes. For accrual of liquidated damages, claim and warranty purposes, "completion" and "complete" mean the point in the Project where (1) Contractor has fully and correctly performed all Work in all parts and requirements, including corrective and punch list work, and (2) Owner's representatives have conducted a final inspection that confirmed this performance. "Substantial" or any other form of partial or non-compliant performance of the Work shall not constitute "completion" or "complete" under the Contract Documents.

**1.2.1** **Add** the following sentence:

Work not particularly detailed, marked, or specified shall be the same as similar parts that are detailed, marked or specified.

**1.2.1 Add the following:**

The provisions of all applicable building codes and ordinances shall be considered a minimum requirement. Where the requirements of these Contract Documents exceed those of such codes or ordinances, these Contract Documents shall govern. In the event of conflict between any of the Contract Documents, the Architect shall determine which of the conflicting provisions shall be followed, and the Contractor shall be obligated to construct the work according to the selected provision without additional cost to the Owner.

**Add the following new Sections 1.2.4 and 1.2.5:**

**1.2.4 Addenda:** Subsequent addenda issued shall govern over prior addenda only to the extent specified. In accordance with Title 24, California Code of Regulations, addenda shall be approved by the Division of the State Architect (DSA).

**1.2.5 Deferred Approvals:** The requirements approved by the DSA on any item submitted as a deferred approval in accordance with Title 24, California Code of Regulations, shall take precedence over any previously issued addenda, drawing or specification.

**1.5.1** **Delete** in its entirety and **substitute** the following**:**

The Drawings, Specifications, and other documents prepared on behalf of the Owner are instruments of the services of the Architect and its consultants and are the property of the Owner. The Contractor may retain one contract record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect, and unless otherwise indicated the Architect shall be deemed the author of them. All copies of them, except the Contractor's record set, shall be returned or suitably accounted for to the Owner, upon request upon completion of the Work. The Drawings, Specifications, and other documents prepared by the Architect, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any subcontractor, sub-subcontractor, or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner and the Architect. The Contractor,

Subcontractors, Sub-subcontractors, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by the Architect appropriate to and for use in the execution of their Work under the Contract Documents. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Owner's property interest or other reserved right. All copies made under this license shall bear appropriate attribution and the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect.

**1.5.2 Delete in its entirety without substitution.**

**2.1.2** **Delete** the entire Section referring to mechanic's liens, which do not apply to public works. Refer to Civil Code Section 3109.

**2.3.6** **Delete** in its entirety and **substitute** the following:

Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor **25 copies** of the Contract Documents without charge. Additional sets will be furnished, upon request from the Contractor, at the price of 1.15 times the Architect's cost of reproduction and delivery.

**Add the following new Section 2.3.7:**

**2.3.7 Existing Utility Lines:**

**.1** **Removal and Relocation of Existing Utility Lines:** Pursuant to Government Code section 4215, the Owner assumes the responsibility for removal, relocation, and protection of utilities located on the Site at the time of commencement of construction under this Contract with respect to any such utility facilities which are not identified in the drawings and specifications made part of the invitation to bid. The Contractor shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of the Owner to provide for removal or relocation of such utility facilities. Owner shall compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, removing or relocating such utility facilities, and for equipment necessarily idle during such work.

**.2** **Assessment of Liquidated Damages:** These sub-sections shall not be construed to preclude assessment against the Contractor for any other delays in completion of the Work. Nothing in these sub-sections shall be deemed to require the Owner to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, or meter junction boxes on or adjacent to the Site.

**.3** **Notification:** If the Contractor, while performing work under this Contract, discovers utility facilities not identified by the Owner in the Contract plans or specifications, then Contractor shall immediately notify the Owner and the utility in writing.

**.4** **Underground Utility Clearance:** It shall be Contractor's sole responsibility to timely notify all public and private utilities serving the Site prior to commencing work. The Contractor shall notify and receive clearance from any cooperative agency, such as Underground Service Alert, in accordance with Government Code section 4216, et seq. Contractor shall promptly provide a copy of all such notifications to the Owner.

**Add the following new Section 2.6:**

**2.6 Owner's Inspector:** The Owner will employ one or more inspectors to provide inspection during normal working hours. The Inspector shall be acceptable to the Architect, Structural Engineer and the Division of the State Architect. The Inspector will have the responsibilities and duties required by law and as assigned to him by the Owner. Inspector and inspection of the Work shall be in accordance with Title 24, Part 1, California Code of Regulations, Section 4-333(b) and 4-342. Special inspection shall be in accordance with Title 24, Part 1, California Code of Regulations, Section 4-333(c). The Inspector will maintain a current copy of the 2022 Title 24, Parts 1 through 5, and Part 9, in good condition on the job site at all times.

**Add the following new Section 2.7:**

**2.7 Right to Audit:** The Contractor shall maintain and make available to the Owner all books, papers, contracts, job cost records, detailed cost estimates, claims, and accounts, including payment, property, payroll, personnel, subcontractors, and financial records related to or which arise out of the Work or under terms of the Contract. The form of record keeping shall be subject to approval by the Owner. These books, papers, records, claims, and accounts shall be made available for examination during normal business hours by Owner and Owner's representative and shall be retained at Contractors principal place of business, in California, for audit during normal business hours at such place of business for four years after recording of the notice of completion of the project. Contractor shall provide an office to enable Owner and Owner's representative to conduct such audit.

**Add the following new Sections 3.4.4:**

**3.4.4 Common Practice:** The Contractor shall waive “common practice”, “common usage”, and “industry standard” as construction criteria wherever the Contract Documents, details, plans, specifications, governing code or ordinances require greater quantity or better quality than common practice, common usage, or industry standard would require.

**3.7.3** **Delete** the phrase "knowing it to be" in the first line.

**3.8.2** **Delete** in its entirety, including sub-sections 3.8.2.1, 3.8.2.2, and 3.8.2.3, and **substitute** the following:

Unless otherwise provided in the Contract Documents, allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes less applicable trade discounts, Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts. Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The Change Order shall reflect the difference between the actual costs and the allowances.

**Add the following new Sections 3.9.4:**

**3.9.4** Should the Contractor’s superintendent be deemed unacceptable to the Owner at any time during the performance of the Work, the Contractor shall replace the superintendent without cost or liability to the Owner.

**Add the following new Sections 3.10.4:**

**3.10.4** In connection with the DSA Construction Oversight Process, which includes the use of inspection cards and review of changes to the DSA-approved construction documents, the Contractor must (a) include specific tasks in its baseline schedule to take into account these procedures since they are critical path issues; and (b) include a reasonable amount of float in the baseline schedule to accommodate the additional time required by these DSA procedures.

**Add the following new Sections 3.12.11 and 3.12.13:**

**3.12.11 Substitutions:**

**.1** **One Product Specified:** Unless the Specifications state that no substitution is permitted, whenever in the Contract Documents any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction is indicated or specified by name, make, trade name, or catalog number, with or without the words “or equal,” such specification shall be deemed to be used for the purpose of facilitating description of material, process, or article desired and shall be deemed to be followed by the words “or equal.” Contractor may, unless otherwise stated, offer any material, process, or article, which shall be substantially equal or better in every respect to that so indicated or specified and will completely accomplish the purpose of the Contract Documents.

**.2** **Two or More Products Specified:** When two or more acceptable products are specified for an item of the Work, the choice will be up to the Contractor. Contractor shall utilize the same product throughout the Project. If a timely substitution request as set forth in Section 3.12.11.3 is not provided and an “or equal” substitution is

requested, then the Owner may consider the substitution if the product specified is no longer commercially available. If the Owner allows the substitution to be proposed pursuant to such an untimely request, then the Contractor will be responsible for the professional fees incurred by the Architect or Architect's consultants in reviewing the proposed substitution, which fees may be withheld from sublease payments and/or retention.

**.3 Substitution Request Form:** Requests for substitutions of products, materials, or processes other than those specified must be made on the Substitution Request form available in Section 01 2500 of the Specifications. Unless otherwise allowed by the Owner, any Requests submitted less than 35 days after the date of the Notice to Proceed will not be considered, except as noted in Section 3.12.11.2. A Substitution Request must be accompanied by evidence as to whether or not the proposed substitution: is equal in quality and serviceability to the specified item; will entail no changes in detail and construction of related work; will be acceptable in consideration of the required design and artistic effect; will provide no cost disadvantage to Owner; and will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts. The burden of proof of these facts shall be upon the Contractor. The Contractor shall furnish with its request sufficient information to determine whether the proposed substitution is equivalent including, but not limited to, all drawings, specifications, samples, performance data, calculations, and other information as may be required to assist the Architect and the Owner in determining whether the proposed substitution is acceptable. The final decision shall be the Owner's. The written approval of the Owner, consistent with the procedure for Change Orders, shall be required for the use of a proposed substitute material. Owner may condition its approval of the substitution upon delivery to Owner of an extended warranty or other assurances of adequate performance of the substitution. All risks of delay due to review and approval by the Division of the State Architect or any other governmental agency having jurisdiction shall be on the requesting party.

**.4 List of Manufacturers and Products Required:** The Subcontractor shall prepare and submit to the Contractor within thirty (30) days of execution of the Contract comprehensive list of the manufacturers and products proposed for the Project, including information on materials, equipment, and fixtures required by the Contract Documents, as may be required for Contractor's or Architect's preliminary approval. Approval of such lists of products shall not be construed as a substitute for the shop drawings, manufacturer's descriptive data, and samples, which are required by the Contract Documents, but rather as a base from which more detailed submittals shall be developed for the final review of the Contractor and the Architect.

**3.12.12 Contractor's Representation Substituted Materials:** By making requests for substitutions the Contractor:

**.1** Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;

**.2** Represents that the Contractor will provide the same or better warranty for the substitution that the Contractor would for that specified;

**.3** Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and

**.4** Represents that if the substitution is accepted, the Contractor will be solely responsible coordinate the installation and fit the accepted substitute into the available space in a manner acceptable to the Owner and the Architect, and for the proper operation of the substitute will all other equipment and building systems with which it may be associated, making such changes as may be required for the Work to be complete in all respects.

**3.12.13 Deferred Approvals:** Deferred approvals shall be submitted and processed pursuant to the requirements of Division 1 of the Specifications. All risks of delay due to review and approval by the Division of the State Architect or any other governmental agency having jurisdiction shall be on the requesting party.

**3.18.1 and 3.18.2 Delete** in their entirety and **substitute** new Sections 3.18.1 through 3.18.6 as follows:

**3.18.1 Contractor's Indemnity:** To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, Architect, Architect's consultants, the Inspector of Record, the State of California, and their respective agents, employees, officers, volunteers, Boards of Trustees, members of the Boards of Trustees, and directors (collectively "Indemnitees"), from and against claims, damages, losses, and expenses (including, but not limited to attorneys' fees, consultants' and experts' fees, and all other related costs and expenses, (collectively "Claims") arising out of or resulting from: performance of the Work (including, but not limited to) the Contractor's or its Subcontractor's use of the Site; the Contractor's or its Subcontractor's construction of the Project, or failure to

construct the Project, or any portion thereof, excluding only such Claims that arise from the sole or active negligence, or willful misconduct of the Indemnitees, or for defected in design furnished by Indemnitees; the use, misuse, erection, maintenance, operation, or failure of any machinery or equipment including, but not limited to, scaffolds, derricks, ladders, hoists, and rigging supports, whether or not such machinery or equipment was furnished, rented, or loaned by any of the Indemnitees; or any act, omission, negligence, or willful misconduct of the Contractor or its Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Contractor, its Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this Section.

**3.18.2 Subcontractor's Indemnity:** The Subcontractors shall defend, indemnify, and hold harmless Indemnitees from and against Claims arising out of or resulting from: performance of the Work, excluding only such Claims that arise from the sole or active negligence, or willful misconduct of the Indemnitees, or for defects in design furnished by Indemnitees, (including, but not limited to) the Subcontractors' use of the Site; the Subcontractors' construction of the Project or failure to construct the Project or any portion thereof; the use, misuse, erection, maintenance, operation, or failure of any machinery or equipment, including, but not limited to, scaffolds, derricks, ladders, hoists, and rigging supports, whether or not such machinery or equipment was furnished, rented, or loaned by any of the Indemnitees; or any act, omission, negligence, or willful misconduct of the Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this Section.

**3.18.3 Subcontractor Joint and Several Liability:** In the event more than one Subcontractor is connected with an accident or occurrence covered by this indemnification, then all such Subcontractors shall be jointly and severally responsible to each of the Indemnitees for indemnification, and the ultimate responsibility among such indemnifying Subcontractors for the loss and expense of any such indemnification shall be resolved without jeopardy to any Indemnitee. The provisions of the indemnity provided for herein shall not be construed to indemnify any Indemnitee for its own negligence if not permitted by law or to eliminate or reduce any other indemnification or right which any Indemnitee has by law or equity.

**3.18.4 No Limitation:** The Contractor's and the Subcontractor's obligation to indemnify and defend the Indemnitees hereunder shall include, without limitation, any and all claims, damages, and costs: for injury to persons and property (including loss of use), and sickness, disease or death of any person; for breach of any warranty, express or implied; for failure of the Contractor or the Subcontractor to comply with any applicable governmental law, rule, regulation, or other requirement; and for products installed in or used in connection with the Work.

**3.18.5** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Sections 3.18.1 and 3.18.2 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under worker's compensation acts, disability benefit acts or other employee benefit acts.

**3.18.6** In the event the Contractor enters into any agreement with the owners of any adjacent property to enter upon such property for the purpose of performing this Contract, the Contractor shall fully indemnify, defend, and hold harmless such person, firm, or corporation, state, or other governmental agency, which owns or has any interest in the adjacent property. The form and content of the indemnification agreement shall be approved by the Owner prior to commencement of any work on or about such property. These provisions shall be in addition to any other requirements of the owners of the adjacent property.

**Add the following new Section 3.19:**

**3.19 Contractor's Duties under California Code of Regulations, Title 24, Part 1:** The Contractor shall comply with all duties and obligations under California Code of Regulations, Title 24, Part 1, Section 4-343. The Contractor shall submit Verified Reports in accordance with Section 4-336 and 4-343(c).

**5.2.1, 5.2.2, 5.2.3, and 5.2.4 Delete** in their entirety and **substitute** new Sections 5.2.1 through 5.2.4 as follows:

**5.2.1 Assignment or Substitution - Consent of Owner:** The Contractor, without the written consent of the Owner, shall not substitute any person or entity as a Subcontractor in place of the Subcontractor originally selected under the Agreement; permit any such Subcontract to be assigned or transferred, or allow it to be performed by any person or entity other than such original Subcontractor; . Any assignment or substitution made without the prior written consent of the awarding authority shall be void, and the assignees shall acquire no rights in the Contract. Any consent, if given, shall not relieve Contractor or its Subcontractors from their obligations under the terms of the Contract Documents.

**5.2.2 Grounds for Substitution:** Pursuant to the procedure set forth therein, the Contractor may request to substitute any person or entity as a Subcontractor in place of a Subcontractor originally selected under the Agreement in the following instances:

**.1** When the Subcontractor originally selected, after having a reasonable opportunity to do so, fails or refuses to execute a written Contract for the scope of work specified in the subcontractor's bid and at the price specified in the subcontractor's bid, when that written Contract, based upon the general terms, conditions, plans and specifications for the Project involved or the terms of that Subcontractor's written bid, is presented to the Subcontractor by the prime contractor;

**.2** When the listed Subcontractor becomes bankrupt or insolvent;

**.3** When the listed Subcontractor fails or refuses to perform its Subcontract;

**.4** When the listed Subcontractor fails or refuses to meet the bond requirements of the prime contractor set forth in Public Contract Code section 4108.

**.5** When the Contractor demonstrates to the Owner, that the name of the Subcontractor was listed as the result of inadvertent clerical error;

**.6** When the listed Subcontractor is not licensed pursuant to the Contractors License Law; or

**.7** When the Owner, determines that the Work being performed by the listed Subcontractor is substantially unsatisfactory and not in substantial accordance with the plans and specifications, or the Subcontractor is substantially delaying or disrupting the progress of the Work.

**.8** When the listed Subcontractor is ineligible to work on a public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

**.9** When the Owner determines that a listed Subcontractor is not a responsible contractor.

**5.2.3 No Change in Contract:** Any substitutions of Subcontractors shall not result in any increase in the Contract Sum or result in the granting of any extension of time for the completion of the Project.

**5.2.4 Substitution Due to Clerical Error:** The Contractor, as a condition of asserting a claim of inadvertent clerical error in the listing of a Subcontractor, shall, pursuant to Public Contract Code Section 4107.5, within two working days after the time of the prime bid opening by the Owner, give written notice to the Owner and copies of such notice to both the Subcontractor it claims to have listed in error, and the intended Subcontractor who had bid to the Contractor prior to bid opening. Any listed Subcontractor who has been notified by the Contractor in accordance with the provisions of this section as to an inadvertent clerical error, shall be allowed six working days from the time of the prime bid opening within which to submit to the Owner and to the Contractor written objection to the Contractor's claim of inadvertent clerical error.

**.1** In all other cases, the Contractor must make a request in writing to the Owner for the substitution of a subcontractor, giving reasons therefore. The Owner shall mail a written notice to the listed Subcontractor giving reasons for the proposed substitution. The listed Subcontractor shall have five working days from the date of such notice within which to file with the Owner written objections to the substitution.

**.2** Failure to file written objections pursuant to the provisions of this section within the times specified herein shall constitute a complete waiver of objection to the substitution by the listed Subcontractor and, where the ground

for substitution is an inadvertent clerical error, an agreement by the listed Subcontractor that an inadvertent clerical error was made.

**.3** If written objections are filed, then the Owner shall give five days notice to the Contractor and to the listed Subcontractor of a hearing by the Owner on the Contractor's request for substitution as provided in Public Contract Code Section 4107. The determination by the Owner shall be final.

**Add new Sections 5.5**

**5.5 SUBCONTRACTOR RESPONSIBILITIES**

**5.5.1 Remedies for Failure to Perform:** Without limitation of any other right or remedy available to Contractor under the Contract Documents or at law, should: the Subcontractor fail to perform its portion of the Work in a skilled and expeditious manner in accordance with the terms of the Contract Documents with sufficient labor, materials, equipment, and facilities; delays the progress of the job or otherwise fail in any of its obligations; or either a receiver is appointed for the Subcontractor or the Subcontractor is declared to be bankrupt or insolvent, and such appointment, bankruptcy, or insolvency proceedings or declaration is not set aside within 30 days, then the Contractor, upon three days notice to the Subcontractor (subject to the requirements of Public Contract Code, §4107), may provide such labor, materials, or perform such work and recover the cost plus profit and overhead from monies due or to become due thereafter to the Subcontractor. The Contractor may terminate the employment of the Subcontractor, taking possession of its tools, materials, and equipment related to the Work and cause the entire portion of the Subcontractor's Work to be finished either by another Subcontractor or through the Contractor's own forces.

**5.5.2 Disputes Not to Affect Work:** If there is any dispute as to whether or not any portion of the Work is within the scope of the Work to be performed by a Subcontractor, or any dispute as to whether or not the Subcontractor is entitled to a Change Order for any Work requested of it or entitled to payment, then the Subcontractor shall continue to proceed diligently with the performance of the Work. Regardless of the size or nature of the dispute, the Subcontractor shall not under any circumstances cease or delay performance of its portion of the Work during the existence of the dispute. The Contractor shall continue to pay the undisputed amounts called for under the Subcontract Agreement during the existence of the dispute. Any party stopping or delaying the progress of the Work because of a dispute shall be responsible in damages to the Owner, the Architect, and the Contractor for any losses suffered as a result of the delay.

**5.5.3 Compliance with Procedures:** Each Subcontractor shall comply with all procedures established by the Contractor for coordination among the Owner, the Owner's consultants, Architect, Contractor, and the various Subcontractors for coordination of the Work with all local municipal authorities, government agencies, utility companies, and any other agencies with jurisdiction over all or any portion of the Work. The Subcontractor shall cooperate fully with all of the foregoing parties and authorities.

**5.5.4 Non-Exclusive Obligations:** The specific requirements of Article 5 are not intended to exclude the obligation of the Subcontractor to comply with any of the other provisions of the General Conditions and the other Contract Documents which are relevant to the proper performance of its portion of the Work.

**Add the following new Sections 7.2.2 through 7.2.10 as follows:**

**7.2.2 Determination of Adjustments to the Contact Sum:** The value of any work covered by a change order or any request for an increase or decrease in the Contract Sum shall be determined on the basis of the cost of the work plus a Contractor's fee for overhead and profit. The following format shall be used as applicable by the Owner and the Contractor to communicate proposed additions and deductions to the Contract.

| CHANGE ORDER REQUEST | | | |
|---|---|---|---|
| | **DESCRIPTION** | **ADDED COST** | **DEDUCTIVE COST** |
| 1 | Subcontractor Labor Total *1* | $ _____ | $ _____ |
| 2 | Subcontractor Material Total *1,2* | $ _____ | $ _____ |
| 3 | Subcontractor Equipment Total *1,2* | $ _____ | $ _____ |
| 4 | **SUBTOTAL #1** (Sum lines 1, 2, and 3) ➔ | $ _____ | $ _____ |
| 5 | Subcontractor Overhead and Profit for Subtotal #1 *3,5* | $ _____ | $ _____ |
| 6 | **SUBTOTAL #2** (Sum lines 4 and 5) ➔ | $ _____ | $ _____ |
| 7 | Contractor Overhead and Profit for Subtotal #2 *3,5* | $ _____ | $ _____ |
| 8 | **SUBTOTAL #3** (Sum lines 6 and 7) ➔ | $ _____ | $ _____ |
| 9 | Contractor Labor Total *1* | $ _____ | $ _____ |
| 10 | Contractor Material Total *1,2* | $ _____ | $ _____ |
| 11 | Contractor Equipment Total *1,2* | $ _____ | $ _____ |
| 12 | **SUBTOTAL #4** (Sum lines 9, 10, and 11) ➔ | $ _____ | $ _____ |
| 13 | Contractor Overhead and Profit for Subtotal #4 *3,5* | $ _____ | $ _____ |
| 14 | **SUBTOTAL #5** (Sum lines 12 and 13) ➔ | $ _____ | $ _____ |
| 15 | Contractor Bonds and Insurance *4* | $ _____ | $ _____ |
| 16 | **TOTAL** (Sum lines 8, 14, and 15) ➔ | $ _____ | $ _____ |
| 17 | Other costs *6* | $ _____ | $ _____ |
| 18 | **GRAND TOTAL** (Sum lines 16 and 17) ➔ | $ _____ | $ _____ |

***FOOT NOTES:***

***1:*** *Attach itemized list(s) indicating hours, rates, material quantity, material costs, and unit costs. Payroll taxes, fringe benefits, insurance and travel shall be included in Additive Costs and shall be credited in Deductive Costs.*

***2:*** *State and City sales taxes shall be included in Additive Costs and shall be credited in Deductive Costs.*

***3:*** *Refer to the Overhead and Profit Schedule below.*

***4:*** *Contractor's bonds and insurance premium. Total cost shall not exceed 2% of the Grand Total (Line 16).*

***5:*** *Overhead and profit shall only be allowed on the net increase.*

***6:*** *Includes all direct and indirect costs, including but not limited to extended overhead where permitted, acceleration, cumulative effect of the change, expediting the Work, scheduling, etc.*

**7.2.3 Cost of the Work:** The term "cost of the work" means the sum of all costs necessarily incurred and paid by the Contractor in the proper performance of the extra work required or permitted under a change order. Except as otherwise may be agreed to in writing by the Owner, such costs shall include only the following items:

**.1 Cost of Labor:** Payroll cost of employees in direct performance of the work including:

- **.1** Payroll wages comparable to but no higher than prevailing wage rates for the specific job classification. Prevailing wage is inclusive of the basic hourly rate, health and welfare, pension, vacation/holiday pay only when applicable, training and "other payments" all as defined by the Director of Industrial Relations.
- **.2** Fringe benefit mark-up is only allowed on the prevailing wage total hourly rate. Cost of fringe benefits are limited to Social Security contributions, Medicare, Federal and State Unemployment tax, State Disability tax and workers compensation but in no case shall they exceed 25% total.
  - **.1** Provide full breakdown of labor rate with fringe benefits and insurance upon request.
  - **.2** Additionally, provide insurance certificates and internal accounting documentation to support cost of insurance if requested.
- **.3** Travel and subsistence as required by the Labor Code or Master Labor Agreements and only when the new work exceeds the original Contract Time.

**.2 Cost of the Material:** Cost of all material and equipment furnished and incorporated into the work including:

- **.1** Direct cost of material or equipment.
- **.2** Incidental or accessory material consumed during the installation.
- **.3** Taxes.
- **.4** Cost of delivery or transportation of the material or equipment.
- **.5** All rebates, refunds and credits for returns or surplus material shall accrue to the Owner.
- **.6** Material invoices shall be submitted with each change order request.
- **.7** Only materials used in the performance of the work will be paid. All excess and surplus materials shall be returned for credit to the Owner.

**.3 Cost of Rental Equipment:** The cost of all rental equipment necessary for the installation of the work, including:

- **.1** The actual rental cost paid to the Rental Agency.
- **.2** Cost of fuel to operate the equipment during the execution of the work only.
- **.3** Cost of transportation set up and take down of rental equipment only if the rental equipment requires specialized handling or set up, or is delivered by the rental company.
- **.4** Only equipment in good working condition and suitable for the intended purpose shall be used. Rental time will not be allowed for down time due to breakdown or non-use.
- **.5** Rental invoices shall be submitted for each item.
- **.6** Heavy equipment owned by the Contractor which would normally be rented, can be charged to the Owner at comparable rental rates substantiated by an actual rental agency cost bid and shall comply with all the requirements of this Section 7.2.3.3.
- **.7** The cost of the operator of the rental equipment shall be included in the cost of the labor and the employee shall be paid the prevailing per diem wage per hour for labor performed on the site.

**.4 Supplemental Expenses:**

- **.1** Any taxes not specifically identified above that is directly attributable to the cost of the work.
- **.2** Additional permit fees, inspection costs or additional governmental agency charges.

**7.2.4 Costs Included in Overhead and Profit:** The following are not considered a cost of the Work but are considered to be overhead costs and are included in the Contractor's fee (Section 7.2.5 below):

**.1** Payroll costs and other compensation of Contractor's officers, executives, principals (of partnership and sole proprietorships), managers, superintendents, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditor, timekeepers, clerks, and other personnel employed by the Contractor whether at the site or in Contractor's principal or a branch office for general administration of the work.

**.2** Expenses of Contractor's principal and branch offices other than Contractor's office at the site.

**.3** Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the work and charges against Contractor for delinquent payments.

**.4** Cost of premiums for all bonds and for all insurance whether or not Contractor is required by the Contract Documents to purchase and maintain the same. Cost shall not exceed 2% of the total cost of the work.

**.5** Cost due to the negligence of Contractor, any subcontractor, or anyone directly or indirectly employed by any of them for whose acts any of them may be liable, including but not limited to the correction of defective work, disposal of materials or equipment wrongly supplied and making good any damage to property.
**.6** Office supplies and equipment consumed in the field office or home office.
**.7** Cost of utility usage, including telephone and fax service, consumed during the installation of the work.
**.8** The use, depreciation, maintenance, rental and replacement of all hand tools (less than $250.00 capital cost per item).
**.9** Contractor owned vehicles, fuel, insurance, and maintenance.
**.10** Cost of change order preparation and negotiation, estimating, scheduling, supervision, drafting, and clerical or secretarial services.
**.11** Cost of time and material documentation procedures.
**.12** Other overhead and general expense costs of any kind and the costs of any item not specifically and expressly included herein.

**7.2.5 Contractor's Fee:**

**.1** **Self-Performed Work:** The Contractor's fee allowed to Contractor for overhead and profit on self-performed work shall be determined by the following percentages of the various portions for the cost of the work:
  **.1** Labor .....15%
  **.2** Materials .....15%
  **.3** Equipment Rental.....15%
  **.4** Other items and expenditures .....15%
  **.5** Contractor's fee shall only be allowed on the net increase in the Contract Sum.

**.2** **Subcontracted Work:** For all allowable expenses defined as cost of the work incurred by subcontractors, the Contractor fee shall be 5% and no more than 2% for all bonds, insurance, builders risk, etc. on the net increase of the subcontracted portion of the cost of the work.
  **.1** In no case shall total combined mark-up on subcontracted and sub-subcontracted work exceed 27%.

**7.2.6 Subcontractor Cost of the Work:**

**.1** All work performed by the subcontractor in the performance of the additional work shall be subject to all requirements stated above and imposed on the General Contractor and shall comply with all the same recording and documentation requirements.
**.2** The subcontractor's fee allowed to subcontractor for overhead and profit shall be determined by the following percentages of the various portions for the cost of the work:
  **.1** Labor .....15%
  **.2** Materials .....15%
  **.3** Equipment Rental.....15%
  **.4** Other items and expenditures .....15%
  **.5** Subcontractor's fee shall only be allowed on the net increase in the cost of the work.
**.3** For all allowable expenses defined as cost of the work incurred by sub-subcontractors, the subcontractor fee shall be 5% on the net increase of the subcontracted portion of the cost of the work.
  **.1** In no case shall combined mark-up on subcontracted and sub-subcontracted work exceed 20%.

**7.2.7 Changes Resulting in a Reduction of the Contract Sum:** If the net value of a change results in a reduction of the Contract Sum from the Contractor or subcontractor, the credit given shall be the net cost of the work without overhead or profit.

**7.2.8 Extended Overhead:** The following items are "Extended Overhead" and may be considered as costs when Contract Time is extended due to additional work or due to a **Class 1** cause defined in 8.3, and solely to the extent directly attributable to extension of time. **In all other instances, the following items shall be considered included in overhead:**

**.1** Field offices, sheds, phones, sanitary facilities, utilities, drinking fountains, cleaning, safety programs, and other construction facilities and temporary controls not specifically required for additional work;
**.2** Additional costs of field supervision.

**7.2.9 Itemized Cost Breakdown:** Whenever the Contractor requests an adjustment to the Contract Sum, Contractor shall submit an itemized cost breakdown in a form acceptable to the Owner, together with supporting data, for all work performed by the Contractor and each subcontractor and sub-subcontractor. The itemized breakdown shall include copies of the original subcontractor invoices or cost statements, certified payroll, invoices for material, invoices for equipment rental, and other data required to substantiate costs claimed.

**Add the following new Section 7.3.3.5:**

**7.3.3.5 Time and Material (T&M):** By cost of material, equipment, labor and a fee for overhead and profit. If the value is determined by this method, then the following requirements shall apply:

**.1 Daily Reports by Contractor:**

**.1** At the close of each working day, the Contractor shall submit a daily report to the Inspector, on forms approved by the Owner, together with applicable delivery tickets, listing all labor, materials, and equipment involved for that day, the location of the Work, and for other services and expenditures when authorized concerning extra work items, including any schedule delay days required. An attempt shall be made to reconcile the report daily, and it shall be signed by the Inspector and the Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points that cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by subcontractors or others shall be submitted through the Contractor. The Contractor shall organize and forward copies of the Contractor's and Inspector's reports to the Architect upon the completion of each T&M activity.

**.2** Any reports not submitted in a timely manner and not signed by the Inspector shall not be considered as a part of the costs considered for the change order. The Contractor shall notify the Inspector prior to starting the work each day.

**.3 Labor:** Show names of workers, classifications, hours worked, and hourly rate. Project Superintendent expenses are not allowed.

**.4 Materials:** Describe and list quantities of materials used.

**.5 Equipment:** Show type of equipment, size, identification number, and hours of operation, including, and hours of operation, including loading and transportation, if applicable, and hourly/daily cost.

**.6 Other Services and Expenditures:** Describe in such detail as the Owner may require.

**8.1.3 Add the following:**

The dates of Substantial Completion and Notice of Completion shall coincide.

**Add the following new subsections 8.3.1.1, 8.3.1.2 and 8.3.1.3:**

**8.3.1.1** The basis for an extension of time exists if the Contractor is delayed in performing the Work, but solely to the extent that delays are unforeseeable, unavoidable, and beyond the control and without fault or negligence, in whole or in part, of the Contractor, subcontractors, sub-subcontractors, and suppliers at every tier, and said delays directly impact the Contractor's ability to achieve Completion in accordance with the Contract Time requirements, and said delays cannot be made up by reasonable efforts otherwise, and said delays stem from the following causes:

**.1 Class 1 Cause:** An act or failure to act on the part of the Owner or Architect or an employee of either, or of a separate contractor employed by the Owner, or concealed or unknown conditions.

**.2 Class 2 Cause:** Abnormal weather, fire, acts of God, riots, civil commotion, acts of War, unavoidable casualties, epidemics, quarantine restrictions, labor disputes, unusual delay in deliveries, freight embargoes, governmental action in connection with the Project including required submittal reviews by the Division of the State Architect, interference in the Project by neighbors, discovery or occurrence of any environmental matter or hazardous material, or the discovery of archaeological artifacts at the site.

**8.3.1.2** If the basis exists for an extension of time under Section 8.3.1, the Owner may either:

**.1** in the case of a **Class 1** cause:

**.1** Include any Extended Overhead in the Change Order extending the Contract Time; or

**.2** Assign any Extended Overhead (defined in 7.2.8) to an allowance pending a final determination of actual impact at the conclusion of the Work, whichever occurs sooner;

**.2** Accept the reasonable and appropriate time extension as determined by the Architect to cover such delays, and in the case of a **Class 2** cause, there will be no corresponding adjustment in Contract Sum, and the sole recourse of the Contractor will be entitlement to time extension as provided by the Architect regardless of actual sources or cause of delay;

**.3** Order the Contractor to accelerate construction activity by working overtime and by adding extra forces in order to overcome such delays, and adjusting the Contract Sum in accordance with Article 7 to compensate the Contractor for such directed acceleration; however, direct costs used in determining such compensation shall be limited to properly substantiated and documented premium or overtime costs; or

**.4** Employ a combination of the above remedies.

**8.3.1.3** Neither the Owner nor the Architect will be obligated or liable to the Contractor for, and the Contractor hereby expressly waives claims against the Owner and Architect on account of damages, costs, expenses, or related impacts which the Contractor, subcontractors, sub-subcontractors, suppliers, or other persons may incur as a result of a **Class 2** cause enumerated in 8.3.1; the Contractor's sole remedy and full compensation in such event shall be extension of Contract Time in accordance with provisions of the Contract Documents. The Contractor likewise waives claims of damages, costs, or expenses due to a delay resulting from a **Class 1** cause except and solely to the extent of costs allowed under 7.2.3, 7.2.4, 7.2.5, and 7.2.6.

**Add the following new Section 8.3.4:**

**8.3.4** In accordance with the provisions of Government Code Section 4215, the Contractor shall not be assessed liquidated damages where delay is caused by failure of the public agency or owner of the utility to provide for the removal or relocation of utility facilities, but only if such utilities are not identified by the Owner in the Contract Documents.

**Add new Section 8.4 as follows:**

**8.4 HOURS OF WORK**

**8.4.1 Sufficient Forces:** Contractors and Subcontractors shall furnish sufficient forces to ensure the prosecution of the Work in accordance with the Construction Schedule.

**8.4.2 Performance During Working Hours:** Work shall be performed during regular working hours, except that if there is an emergency or when required to complete the Work in accordance with job progress, then work may be performed outside of regular working hours with the advance written consent of the Owner.

**8.4.3 Labor Code:** As provided in Article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, eight hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by the Contractor or by any Subcontractor on any subcontract under this Contract, upon the work or upon any part of the work contemplated by this Contract, is limited and restricted to eight hours during any one calendar day and 40 hours during any one calendar week, except as hereinafter provided. Notwithstanding the provision hereinabove set forth, work performed by employees of Contractors in excess of eight hours per day and 40 hours during any one week shall be permitted upon this public work with compensation provided for all hours worked in excess of eight hours per day at not less than one and one-half times the basic rate of pay.

**.1** Contractor or subcontractor shall pay to the Owner a penalty of Twenty-five Dollars ($25.00) for each worker employed in the execution of this Contract by the Contractor, or by any Subcontractor, for each calendar day during which such worker is required or permitted to work more than eight hours in any calendar day and 40 hours in any one (1) calendar week, in violation of the provisions of Article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, unless compensation for the workers so employed by Contractor is not less than one and one-half times the basic rate of pay for all hours worked in excess of eight hours per day.

**8.4.4 Costs for After Hours Inspection:** If the work done after hours is required by the Contract Documents to be done outside the Contractor's or the Inspector of Record's regular working hours, then the costs of any inspections, if required to be done outside normal working hours, shall be borne by the Owner.

**.1** If the Owner allows the Contractor to do work outside regular working hours for the Contractor's own convenience, then the costs of any inspections required outside regular working hours, among other

remedies, shall be invoiced to the Contractor by the Owner and withheld from payments and/or retention. Contractor shall give Owner at least 48 hours notice prior to working outside regular working hours.

**.2** If the Contractor elects to perform work outside the Inspector of Record's regular working hours, then costs of any inspections required outside regular working hours, among other remedies, may be invoiced to the Contractor by the Owner and withheld from payments and/or retention.

**Add the following subsections 9.5.1.8 through 9.5.1.18:**

**.8** liquidated damages against the Contractor, whether already accrued or estimated to accrue in the future;

**.9** failure of the Contractor to maintain record drawings;

**.10** erroneous estimates by the Contractor of the value of the Work performed, or other false statements in connection with a payment or the Contractor's submissions to the Owner prior to any payment;

**.11** unauthorized deviations from the Contract Documents;

**.12** subsequently discovered evidence or observations nullifying the whole or part of a previously issued Sublease Payment;

**.13** overpayment to Contractor on a previous payment;

**.14** credits owed to Owner for reduced scope of work or work that Contractor will not perform;

**.15** the estimated cost of performing work pursuant to Section 2.4;

**.16** actual damages related to false claims by Contractor; and

**.17** as permitted by other provisions in the Contract or as otherwise allowed by law, including statutory penalties Owner or other entities assessed against Contractor. (See e.g., Labor Code section 1813 (working hours) or Public Contract Code section 4110 (subcontractor listings and substitutions)). Owner may withhold from a payment up to 150% of disputed amounts. No interest shall be paid on any amounts withheld.

**.18** for any stop payment notice, the Owner shall withhold the amount stated in the stop payment notice, the stop notice claimant's anticipated interest and court costs, and an amount to provide for the public entity's reasonable cost of any litigation pursuant to the stop payment notice. For any stop payment notice action the parties resolve before judgment is entered, Owner has the right to permanently withhold for any reasonable cost of litigation for that stop payment notice, even if it exceeds the amount originally withheld by Owner for the estimated reasonable cost of litigation. However, if (1) the Contractor at its sole expense provides a bond or other security satisfactory to the Owner in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the Owner, which protects the Owner against such claim, and (2) the Owner chooses to accept the bond, then Owner would release the stop payment notice funds withheld to the Contractor, except that Owner may permanently withhold for any reasonable cost of litigation. Any stop payment notice release bond shall be executed by a California admitted, fiscally solvent surety, completely unaffiliated with and separate from the surety on the payment and performance bonds, that does not have any assets pooled with the payment and performance bond sureties.

**Add new section 9.5.5 as follows:**

**9.5.5** This Project is subject to the provisions of Public Contract Code § 22300 whereby the Contractor may elect to enter into an escrow for the deposit of securities and/or funds withheld to ensure performance of the contract. Any escrow used shall be established using the escrow agreement form specified in the Contract Documents.

**9.7** **Delete** this Section in its entirety and **substitute** the following:

If the Owner does not pay the Contractor within thirty days after receipt of an undisputed and properly submitted payment request for a progress payment, excluding that portion of the final payment designated by the contract as retention earnings, then the Owner shall pay interest to the Contractor as provided by Public Contract Code Section 20104.50. If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, the number of days available to Owner to make payment without incurring interest pursuant to this section shall be reduced by the number of days by which the Owner exceeds the seven-day return requirement set forth in Section (2) of subdivision (c) of Public Contract Code Section 20104.50. As further provided by Public Contract Code Section 20104.50, said interest penalty is the sole recourse of Contractor and Contractor shall have no right to stop the Work until payment of the amount owing has been received, nor shall the Contract Time be extended, nor shall the Contract Sum be increased

in any way, including by reason of any costs incurred by the Contractor, except to the extent of said interest payment.

**Add the following new Section 9.7.1:**

**9.7.1** Notwithstanding this section and notwithstanding the provisions of Public Contract Code Section 20104.50, the Contractor understands and agrees that funds for payment to the Contractor are to be provided by the State of California, State Allocation Board during the course of the Work. If such funds are not provided in a timely fashion through no fault of the Owner and for that reason are not available to make a progress payment, the provisions of this section requiring interest payments to the Contractor shall not be applicable.

**9.9.3** **Delete** the phrase "not complying with the requirements of the Contract Documents".

**Add the following new Section 9.10.6:**

**9.10.6** Pursuant to Public Contract Code Section 7107, in the event of a dispute between the Owner and Contractor, the Owner may withhold from the final payment an amount not to exceed 150 percent of the disputed amount plus any amounts necessary to cover any filed and unreleased stop notices. Except as so withheld, the Owner shall release the retention withheld within 35 days after the date of completion of the work of improvement, as "completion" is defined in Public Contract Code Section 7107. In the event that retention payments are not made within the time periods required by Public Contract Code Section 7107, the Owner or the Contractor withholding the unpaid amounts shall be subject to the interest provisions of Public Contract Code Section 7107.

**10.2.2 Add the following:**

The Contractor shall comply with California Code of Regulations, Title 24, in addition to all other applicable regulations, as noted in Section 10.2.2. Contractor shall keep a copy of the latest edition, Parts 1 through 5, Part 7 and Part 9, on the job site at all times, and keep it available for reference use. Nothing in these plans or specifications shall be construed to permit work not conforming to these codes. A copy of stamped plans and specifications shall be kept on the job site and made available to the Owner's Inspector.

**Add the following new Sections 10.2.9 and 10.2.10:**

**10.2.9 Fingerprinting:** At its own expense, Contractor shall comply with all fingerprinting requirements under law and Contract, including, but not limited to, the requirements of California Education Code section 45125.2 and the Independent Contractor Student Contact Form which is a part of the Contract. Contractor shall hold harmless, defend and indemnify the Owner under Section 3.18, for any costs, including attorneys' fees, Owner incurs from Contractor's failure to comply.

**10.2.10 Alcohol and Tobacco:** At its own expense, Contractor shall take all steps necessary to ensure that employees and agents of Contractor or any of its Subcontractors do not use, consume, or work under the influence of any alcohol, tobacco or controlled substance while on school property, or performing any functions related to the Project. Contractor shall further prevent any of its employees or agents, or those of its Subcontractors from playing any recorded music devices or radios or wearing any radio headphone devices for entertainment while working on the Project. Likewise, Contractor shall prevent its employees or Subcontractor's employees from bringing any animal onto the Project. Contractors shall not violate any written school policies.

**10.2.11 Sanctioned Entities & Iran Contracting Act:**

**.1** Contractor is not an entity under any form of sanction imposed by the United States of America, or the State of California, and is not listed as such by the U.S. Department of State (a "Sanctioned Entity"), which list may be referenced at: https://sanctionssearch.ofac.treas.gov/ or https://www.treasury.gov/ofac/downloads/ssi/ssilist.pdf. Further, Contractor is not an Affiliate (any person or entity directly or indirectly controlling; controlled by or under common control with Contractor; owned in whole or in part by Contractor; that owns any interest in Contractor, in whole or in part; that is a current creditor or debtor to Contractor) of any Sanctioned Entity.

**.2** Contractor shall exercise all due diligence, including, without limitation, consulting the U.S. Department of State list of sanctioned entities, which may be referenced at https://sanctionssearch.ofac.treas.gov or https://www.treasury.gov/ofac/downloads/ssi/ssilist.pdf , to ensure Contractor is not currently party to any contract with, and shall not enter into any contractual relationship with any Sanctioned Entity during the term of any agreement by and between Contractor and Owner or in relation to any agreement by and between Contractor and Owner.

**10.2.12 Shoring and Structural Loading:** The Contractor shall not impose structural loading upon any part of the Work under construction or upon existing construction on or adjacent to the Site in excess of safe limits, or loading such as to result in damage to the structural, architectural, mechanical, electrical, or other components of the Work. The design of all temporary construction equipment and appliances used in construction of the Work and not a permanent part thereof, including, without limitation, hoisting equipment, cribbing, shoring, and temporary bracing of structural steel, is the sole responsibility of the Contractor. All such items shall conform to the requirements of governing codes and all laws, ordinances, rules, regulations, and orders of all authorities having jurisdiction. The Contractor shall take special precautions, such as shoring of masonry walls and temporary tie bracing of structural steel work, to prevent possible wind damage during construction of the Work. The installation of such bracing or shoring shall not damage or cause damage to the Work in place or the Work installed by others. Any damage which does occur shall be promptly repaired by the Contractor at no cost to the Owner.

**Add the following new Sections 10.3.7 and 10.3.8:**

**10.3.7** The covenants, warranties, and representations contained in this Section will be effective on the date of execution of this Contract and will survive completion of the project. Contractor covenants, warrants and represents to Owner that:

**.1** To Contractor's knowledge after due inquiry, no asbestos-containing materials or PCB's will be installed or exposed in the project at any time during the Contractor's construction thereof.

**.2** To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or will be located on the project at any time during Contractor's construction thereof.

**.3** Contractor's operations concerning the project are not and will not be in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials, substances or toxic substances, and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any work, repairs, construction, alteration or installation on or in connection with the project in order to comply with any such laws, ordinances, codes or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide the Owner with copies thereof.

**10.3.8 Environmental Indemnification**: To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, Architect, Architect's consultants, the Inspector of Record, the State of California, and their respective agents, employees, officers, volunteers, Boards of Trustees, members of the Boards of Trustees, and directors (collectively “Indemnitees”), from and against claims, damages, losses, and expenses (including, but not limited to attorneys' fees, consultants’ and experts’ fees, and all other related costs and expenses, (collectively “Claims”) arising out of any breach of the environmental or toxic warranty, representations or covenants of the Contractor under this contract excluding only such Claims that arise from the sole or active negligence, or willful misconduct of the Indemnitees, or for defected in design furnished by Indemnitees; or any act, omission, negligence, or willful misconduct of the Contractor or its Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Contractor, its Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this Section. Contractor further agrees to indemnify, defend, and hold harmless Owner, Architect, their officers, employees and agents, from and against any and all liability as follows:

**.1** From all foreseeable and all unforeseeable consequential damages, directly or indirectly arising out of use, generation, storage, or disposal of hazardous materials by Contractor; and

**.2** Without limitation, from the cost of any required or necessary repair, cleanup or detoxification and the preparation of any closure or other required plans, whether such action is required or necessary prior to or following filing of the Notice of Substantial Completion, to the full extent that such action is attributable, directly or indirectly, to the presence or use, generation, storage, release, threatened release or disposal of hazardous materials by any person on the project prior to filing of the Notice of Substantial Completion.

**.3** Contractor's obligations pursuant to the foregoing indemnity shall survive the filing of Notice of Completion of the Project.

**.4** This agreement, as to indemnity and reimbursement as above set forth to be undertaken by the Contractor, shall survive the performance of the remainder of said Contract and shall remain in full force and effect notwithstanding such performance.

**Delete Article 11 in its entirety and substitute the following:**

**ARTICLE 11 INSURANCE AND BONDS**
**11.1 CONTRACTOR'S LIABILITY INSURANCE**

**11.1.1 Liability Insurance Requirements:** Before commencement of the Work and within limits acceptable to the Owner, the Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in California as admitted carriers with a financial rating of at least A+, Class XII status as rated in the most recent edition of Best's Insurance Reports. The amount of general liability insurance shall be $2,000,000 per occurrence for bodily injury, personal injury, and property damage, and the amount of automobile liability insurance shall be $1,000,000 per accident for bodily injury and property damage combined single limit. The policies will protect the Contractor from claims set forth below, which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations are by the Contractor, by a Subcontractor, by Sub-subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

**.1** Claims for damages because of bodily injury (including emotional distress), sickness, disease, or death of any person other than the Contractor's employees. This coverage shall be provided in a form at least as broad as Insurance Services Office (ISO) Form CG 0001 11188;

**.2** Claims for damages arising from personal or advertising injury in a form at least as broad as ISO Form CG 0001 11188;

**.3** Claims for damages because of injury or destruction of tangible property, including loss of use resulting therefrom, arising from operations under the Contract Documents; and

**.4** Claims for damages because of bodily injury, death of a person, or property damage arising out of the ownership, maintenance, or use of a motor vehicle, all mobile equipment, and vehicles moving under their own power and engaged in the Work; and

**.5** Claims involving blanket contractual liability applicable to the Contractor's obligations under the Contract Documents, including liability assumed by and the indemnity and defense obligations of the Contractor and the Subcontractors; and

**.6** Claims involving Completed Operations, Independent Contractors' coverage, and Broad Form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, and excavating. (XCU)

If commercial general liability insurance or another insurance form with a general aggregate limit is used, then either the general aggregate limit shall apply separately to the project location (with the ISO CG 2501 or insurer's equivalent endorsement provided to the Owner) or the general aggregate limit shall be twice the required occurrence limit.

Any deductible or self-insured retention must be declared to and approved by the Owner. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its Board of Trustees, members of its Board of Trustees, officers, employees, agents and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

**11.1.2 Subcontractor Insurance Requirements:** The Contractor shall require its Subcontractors and any Sub-subcontractors to take out and maintain similar public liability insurance and property damage insurance, in a company or companies lawfully authorized to do business in California as admitted carriers with a financial rating of at least A+, Class XII status as rated in the most recent edition of Best's Insurance Reports, in like amounts and scope of coverage.

**11.1.3 Owner's Insurance:** The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance. Optionally, the Owner may purchase and maintain other insurance for self-protection against claims which may arise from operations under the Contract. The Contractor shall not be responsible for purchasing and maintaining this optional Owner's liability insurance unless specifically required by the Contract Documents.

**11.1.4 Additional Insured Endorsement Requirements:** The Contractor shall name, on any policy of insurance, the Owner and the Architect as additional insureds. Subcontractors shall name the Contractor, the Owner and the Architect as additional insureds. The Additional Insured Endorsement included on all such insurance policies shall state that coverage is afforded the additional insured with respect to claims arising out of operations performed by or on behalf of the insured. If the additional insureds have other insurance which is applicable to the loss, then such other insurance shall be excess to any policy of insurance required herein. The amount of the insurer's liability shall not be reduced by the existence of such other insurance.

**11.1.5 Workers' Compensation Insurance:** During the term of this Contract, the Contractor shall provide workers' compensation insurance for all of the Contractor's employees engaged in Work under this Contract on or at the Site of the Project and, in case any of the Contractor's work is sublet, the Contractor shall require the Subcontractor to provide workers' compensation insurance for all the Subcontractor's employees engaged in Work under the subcontract. Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in Work under this Contract on or at the Site of the Project is not protected under the Workers' Compensation laws, the Contractor shall provide or cause a Subcontractor to provide adequate insurance coverage for the protection of those employees not otherwise protected. The Contractor shall file with the Owner certificates of insurance as required under this Article and in compliance with Labor Code section 3700.

If the contractor fails to maintain such insurance, then the Owner may take out compensation insurance which the Owner might be liable to pay under the provisions of the Act by reason of an employee of the Contractor being injured or killed, and withhold from Sublease Payments the amount of the premium for such insurance.

**11.1.6 Builder's Risk/"All Risk" Insurance:** Contractor (unless otherwise provided by Owner at Owner's sole discretion), during the progress of the Work and until final acceptance of the Work by Owner upon completion of the entire Contract, shall maintain Builder's Risk/Course-of-Construction insurance satisfactory to the Owner, issued on a completed value basis on all insurable Work included under the Contract Documents. This insurance shall insure against all risks, including, but not limited to, the following perils: vandalism, theft, malicious mischief, fire, sprinkler leakage, civil authority, sonic boom, explosion, collapse, flood, earthquake (for projects not solely funded through revenue bonds, limited to earthquakes equivalent to or under 3.5 on the Richter Scale in magnitude), wind, hail, lightning, smoke, riot or civil commotion, debris removal (including demolition) and reasonable compensation for the Architect's services and expenses required as a result of such insured loss. This insurance shall provide coverage in an amount not less than the full cost to repair, replace or reconstruct the Work. Such insurance shall include the Owner, the Architect, and any other person or entity with an insurable interest in the Work as an additional named insured.

The Contractor shall submit to the Owner for its approval all items deemed to be uninsurable under the Builder's Risk/Course-of Construction insurance. The risk of the damage to the Work due to the perils covered by the Builder's Risk/Course-of-Construction insurance, as well as any other hazard which might result in damage to the Work, is that of the Contractor and the surety, and no claims for such loss or damage shall be recognized by the Owner, nor will such loss or damage excuse the complete and satisfactory performance of the Contract by the Contractor.

**11.1.7 Consent of Insurer for Partial Occupancy or Use:** Partial occupancy or use in accordance with the Contract Documents shall not commence until the insurance company providing property insurance has consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company and shall, without mutual consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of the insurance.

**11.1.8 Fire Insurance:** Before the commencement of the Work, the Contractor shall procure, maintain, and cause to be maintained at the Contractor's expense, fire insurance on all Work included under the Contract Documents, insuring the full replacement value of such Work as well as the cost of any removal and demolition necessary to replace or repair all Work damaged by fire. The amount of fire insurance shall be subject to approval by the Owner and shall be sufficient to protect the Work against loss or damage in full until the Work is accepted by the Owner. Should the Work being constructed be damaged by fire or other causes during construction, it shall be replaced in accordance with the requirements of the drawings and specifications without additional expense to the Owner.

**11.1.9 Other Insurance:** The Contractor shall provide all other insurance required to be maintained under applicable laws, ordinances, rules, and regulations.

**11.1.10 Proof of Carriage of Insurance:** The Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract until all required insurance, certificates, and an Additional Insured Endorsement and Declarations Page have been obtained and delivered in duplicate to the Owner for approval subject to the following requirements:

**.1** Certificates and insurance policies shall include the following clause:
This policy shall not be non-renewed, canceled, or reduced in required limits of liability or amounts of insurance until notice has been mailed to the Owner. Date of cancellation or reduction may not be less than thirty (30) days after the date of mailing notice.

**.2** Certificates of insurance shall state in particular those insured, the extent of insurance, location and operation to which the insurance applies, the expiration date, and cancellation and reduction notices.

**.3** Certificates of insurance shall clearly state that the Owner and the Architect are named as additional insureds under the policy described and that such insurance policy shall be primary to any insurance or self-insurance maintained by Owner and any other insurance carried by the Owner with respect to the matters covered by such policy shall be excess and non-contributing.

**.4** The Contractor and its Subcontractors shall produce a certified copy of any insurance policy required under this Section upon written request of the Owner.

**11.1.11 Compliance:** If any contractor fails to furnish and maintain any insurance required by this Article, then the Contractor shall be in default under the Contract. Compliance by Contractor with the requirement to carry insurance and furnish certificates, policies, Additional Insured Endorsement and Declarations Page evidencing the same shall not relieve the Contractor from liability assumed under any provision of the Contract Documents, including, without limitation, the obligation to defend and indemnify the Owner and the Architect.

**11.2 PERFORMANCE AND PAYMENT BONDS**

**11.2.1 Bond Requirements:** Unless otherwise specified in the Contract Documents, prior to commencing any portion of the Work, the Contractor shall apply for and furnish Owner separate payment and performance bonds for its portion of the Work which shall cover 100% faithful performance of and payment of all obligations arising under the Contract Documents and/or guaranteeing the payment in full of all claims for labor performed and materials supplied for the Work. All bonds shall be provided by a corporate surety authorized and admitted to transact business in California. All bonds shall be submitted on the Owner's approved form.

To the extent, if any, that the Total Sublease Amount is increased in accordance with the Contract Documents, the Contractor shall cause the amount of the bonds to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the Owner. To the extent available, the bonds shall further provide that no change or alteration of the Contract Documents (including, without limitation, an increase in the Total Sublease Amount, as referred to above), extensions of time, or modifications of the time, terms, or conditions of payment to the

Contractor will release the surety. If the Contractor fails to furnish the required bond, then the Owner may terminate the Contract for cause.

**11.2.2 Surety Qualification:**

Only bonds executed by admitted Surety insurers as defined in Code of Civil Procedure section 995.120 shall be accepted. The surety insurers must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bonds, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurers selected by Contractor and to require Contractor to obtain bonds from surety insurers satisfactory to the Owner.

**Add the following new Section 12.2.2:**

**12.2.2 Non-Conformance Notice:** A notice issued by the Architect or the Inspector documenting that the Work or some portion thereof fails to conform to the requirements of the Contract Documents. Upon receipt of a Non-Conformance Notice the Contractor shall provide a written response within 10 calendar days after receipt of the Notice. The Contractor's response shall detail either a) why it is believed that the Work was performed in accordance with the Contract documents or b) what corrective action will be taken, at the Contractor's sole expense, to correct the non-conforming Work. If the Contractor disputes issuance of the Notice the Architect has 10 working days in which to respond by either a) withdrawing the Notice of Non-Conformance or b) directing the Contractor to correct the Work. Such determination by the Architect shall be final and conclusive of the matter. If directed to correct the Work, the Contractor shall do so within 10 calendar days after receipt of such direction from the Architect, or such other time as may be agreed to with the Architect. Payment shall not be made on any portion of the Work for which a Non-Conformance Notice has been issued and the Work not corrected to the satisfaction of the Architect.

**Add the following new Sections 12.2.6 and 12.2.7:**

**12.2.6 Existing Utilities:** In accordance with the provisions of Government Code Section 4215, the Owner shall assume the responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the site of the Work, if such utilities are not identified by the Owner in the plans and specifications made a part of the invitation for bids. 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 such utility facilities if such are not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work. Nothing herein shall be deemed to require the Owner to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the site of the construction project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction. If the Contractor while performing the Work discovers utility facilities not identified by the Owner in the plans or specifications, he shall immediately notify the Owner and utility in writing. The public utility shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price.

**12.2.7 Nonconforming Work and Withholding:** If it is found at any time before completion of the Work that the Contractor has varied from the Contract Documents in materials, quality, form, finish, or in the amount or value of the materials or labor used, then the Owner may, in addition to other remedies in the Contract Documents or under law and as allowed by law, accept the improper work. The Owner may withhold from any amount due or to become due Contractor that sum of money equivalent to the difference in value between the Work performed and that called for by the Drawings and Specifications. The Owner shall determine such difference in value. No structural related work shall be accepted that is not in conformance with the Contract Documents.

**13.1** **Delete** in its entirety and **substitute** the following:

The Contract shall be governed by the law of the place where the Project is located.

**13.4.1** **Delete** Section 13.4.1 in its entirety and **substitute** the following:

**13.4.1:** Tests and inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by the applicable laws, codes, rules and regulations or lawful orders of public authorities. The Owner, with the approval of the Architect and Division of the State Architect, will select a qualified testing laboratory as the testing agency to conduct the tests. The Contractor shall give the Project Inspector timely notice of when and where tests and inspections are to be made so that the Project Inspector may be present for such procedures. The Owner shall bear the costs of all tests and inspections; however, the Owner shall deduct from the Contract Sum by change order for such charges, (1) when such costs are stipulated by the Contract Documents to be paid by the Contractor, and (2) charges for retesting or reinspection when the work fails to meet the requirements of the Contract Documents, including compensation for the Architect's or Project Inspector's services and expenses.

**13.4.2** **Delete** Section 13.4.2 in its entirety and **substitute** the following:

**13.4.2** If the Inspector of Record, the Architect, the Owner, or authorities having jurisdiction determines that portions of the Work require additional testing, inspection, or approval not included under section 13.4.1, then the Inspector of Record will, upon written authorization from the Owner, make arrangements for such additional testing, inspection, or approval. The Owner shall bear such costs except as provided in section 13.4.1.

**13.4.3** **Delete** this Section without substitution.

**13.4.4** **Delete** Section 13.4.4 in its entirety and **substitute** the following:

**13.4.4:** Testing laboratory test and special inspection reports shall be distributed by the testing laboratory or special inspector directly to the Owner, the Architect, the Structural Engineer, the Contractor and the authorities having jurisdiction.

**Add the following new Section 13.6 through 13.12:**

**13.6 TRENCH EXCAVATION**

**13.6.1 Trenches Greater Than Five Feet:** Pursuant to Labor Code section 6705, if the Contract Sum exceeds $25,000 and involves the excavation of any trench or trenches five feet or more in depth, then the Contractor shall, in advance of excavation, submit to the Owner or a registered civil or structural engineer employed by the Owner a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

**13.6.2 Excavation Safety:** If such plan varies from the Shoring System Standards established by the Construction Safety Orders, then the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the Owner or by the person to whom authority to accept has been delegated by the Owner.

**13.6.3 No Tort Liability of Owner:** Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the Owner or any of its employees.

**13.6.4 No Excavation Without Permits:** The Contractor shall not commence any excavation work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

**13.7 PREVAILING WAGE RATES**

**13.7.1 State Prevailing Wages:** Pursuant to the provisions of Article 2 (commencing at § 1720), Chapter 1, Part 7, Division 2, of the Labor Code, the Owner has obtained the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public works project is to be performed for

each craft, classification, or type of worker needed for this Project from the Director of the Department of Industrial Relations ("Director"). These rates are on file at the administrative office of the Owner and are also available from the Director of the Department of Industrial Relations. Copies will be made available to any interested party on request. The Contractor shall post a copy of such wage rates at appropriate, conspicuous, weatherproof points at the Site.

Any worker employed to perform Work on the Project, but such Work is not covered by any classification listed in the published general prevailing wage rate determinations or per diem wages determined by the Director of the Department of Industrial Relations, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to the employment of such person in such classification.

**.1** **Holiday and Overtime Pay:** Holiday and overtime work, when permitted by law, shall be paid for at the rate set forth in the prevailing wage rate determinations issued by the Director of the Department of Industrial Relations or at least one and one-half (1½) times the specified basic rate of per diem wages, plus employer payments, unless otherwise specified in the Contract Documents or authorized by law.

**.2** **Wage Rates Not Affected by Subcontracts:** The Contractor shall pay and shall cause to be paid each worker engaged in the execution of the Work on the Project not less than the general prevailing rate of per diem wages determined by the Director, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such workers.

**.3** **Per Diem Wages:** The Contractor shall pay and shall cause to be paid to each worker needed to execute the Work on the Project per diem wages including, but not limited to, employer payments for health and welfare, pensions, vacation, travel time and subsistence pay as provided for in Labor Code §1773.1.

**.4** **Forfeiture and Payments:** Pursuant to Labor Code §1775, the Contractor shall forfeit to the Owner, not more than Two Hundred Dollars ($200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing wages rates as determined by the Director of the Department of Industrial Relations, for the work or craft in which the worker is employed for any Work done under the Agreement by the Contractor or by any Subcontractor under it. The amount of the penalty shall be determined by the Labor Commissioner and shall be based on consideration of: (1) whether the Contractor or Subcontractor's failure to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily correct upon being brought to the attention of the Contractor or Subcontractor; and (2) whether the Contractor or Subcontractor has a prior record of failing to meet its prevailing wage obligations.

**.5** **Monitoring and Enforcement by Labor Commissioner:** Monitoring and enforcement of the prevailing wage laws and related requirements will be performed by the Labor Commissioner/ Department of Labor Standards Enforcement (DLSE). The Contractor and all Subcontractors shall be required to furnish, at least monthly, certified payroll records directly to the Labor Commissioner in accordance with Labor Code section 1771.4. All payroll records shall be furnished in a format required by the Labor Commissioner. The Contractor and all Subcontractors must sign up for, and utilize, the Labor Commissioner's electronic certified payroll records submission system. The District will have direct and immediate access to all CPRs for the Project that are submitted through the Labor Commissioner's system. The District can use this information for any appropriate purpose, including monitoring compliance, identifying suspected violations, and responding to Public Records Act requests.

**.1** The Labor Commissioner/ DLSE may conduct various compliance monitoring and enforcement activities including, but not limited to, confirming the accuracy of payroll records, conducting worker interviews, conducting audits, requiring submission of itemized statements prepared in accordance with Labor Code section 226, and conducting random in-person inspections of the Project site ("On-Site Visits"). On-Site Visits may include inspections of records, inspections of the Work site and observation of work activities, interviews of workers and others involved with the Project, and any other activities deemed necessary by the Labor Commissioner/DLSE to ensure compliance with prevailing wage requirements. The Labor Commissioner/DLSE shall have free access to any construction site or other place of labor and may obtain any information or statistics pertaining to the lawful duties of the Labor Commissioner/DLSE.

**.2** Any lawful activities conducted or any requests made by the Labor Commissioner/DLSE shall not be the basis for any delays, claims, costs, damages or liability of any kind against the District by the Contractor. Contractor and all Subcontractors shall cooperate and comply with any lawful requests by the Labor Commissioner/ DLSE. The failure of the Labor Commissioner, DLSE, or any other entity related to the Department of Industrial Relations to comply with any requirement imposed by the California Code of

Regulations, Title 8, Chapter 8 shall not of itself constitute a defense to the failure to pay prevailing wages or to comply with any other obligation imposed by Division 2, Part 7, Chapter 1 of the Labor Code.

**.3** Prior to commencing any Work on the Project, the Contractor shall post the required notice/poster required under the California Code of Regulations and Labor Code section 1771.4 in both English and Spanish at a conspicuous, weatherproof area at the Project site. The required notice/poster is available on the Labor Commissioner's website.

**.6 Records of Wages Paid (Payroll Records):**

**.1** Payroll Records:

**.1** Pursuant to §1776 of the Labor Code, the Contractor and each Subcontractor shall keep an accurate payroll record showing the name, address, social security number, work classification and straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection with the Project.

**.2** All payroll records as specified in Labor Code §1776 of the Contractor and all Subcontractors shall be certified and furnished directly to the Labor Commissioner in accordance with Labor Code §1771.4(a)(3) on a monthly basis (or more frequently if required by the District or the Labor Commissioner) and in a format prescribed by the Labor Commissioner. Payroll records as specified in Labor Code §1776 shall be certified and submitted to the District with each application for payment. All payroll records shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

**.3** A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

**.4** A certified copy of all payroll records shall be made available for inspection or furnished upon request to a representative of Owner, the Division of Labor Standards Enforcement or the Division of Apprenticeship Standards of the Department of Industrial Relations.

**.5** A certified copy of all payroll records shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through the Owner, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to Paragraph (2) above, the requesting party shall, prior to being provided the records, reimburse the costs, according to law for the preparation by the Contractor, Subcontractor(s), and the entity through which the request was made. The public shall not be given access to such records at the principal office of the Contractor.

**.6** The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the Division of Labor Standards Enforcement.

**.7** The Contractor or Subcontractor(s) shall file a certified copy of all payroll records with the entity that requested such records within 10 calendar days after receipt of a written request.

**.8** Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the Owner, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor awarded the Contract or the Subcontractor(s) performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (Section 175a of Title 29 of the United States Code) shall be marked or obliterated only to prevent disclosure of an individual's name and social security number. Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided non-redacted copies of certified payroll records.

**.9** The Contractor shall inform the Owner of the location of all payroll records, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

**.10** The Contractor or Subcontractor(s) shall have 10 calendar days in which to comply subsequent to receipt of a written notice requesting payroll records. In the event that the Contractor or Subcontractor(s) fails to comply within the 10-day period, the Contractor or Subcontractor(s) shall, as

a penalty to the Owner, forfeit One Hundred Dollars ($100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

**.11** Responsibility for compliance with this Article shall rest upon the Contractor.

**.2** Withholding of Contract Payments & Penalties:

**.1** The Owner may withhold or delay contract payments to the Contractor and/or any Subcontractor if:

**.2** The required prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations is not paid to all workers employed on the Project; or

**.3** The Contractor or Subcontractor(s) fail to submit all required certified payroll records with each application for payment, but not less than once per month; or

**.4** The Contractor or Subcontractor(s) submit incomplete or inadequate payroll records; or

**.5** The Contractor or Subcontractor(s) fail to comply with the Labor Code requirements concerning apprentices; or

**.6** The Contractor or Subcontractor(s) fail to comply with any applicable state laws governing workers on public works projects.

**.7 Apprentices:**

**.1** Apprentice Wages and Definitions. All apprentices employed by the Contractor to perform services under the Contract shall be paid the standard wage paid to apprentices under the regulations of the craft or trade for which he or she is employed, and as determined by the Director of the Department of Industrial Relations, and shall be employed only at the craft or trade to which he or she is registered. Only apprentices, as defined in §3077 of the Labor Code, who are in training under apprenticeship standards that have been approved by the Chief of the Division of Apprenticeship Standards and who are parties to written apprenticeship agreements under Chapter 4 (commencing with §3070) of Division 3, are eligible to be employed under this Contract. The employment and training of each apprentice shall be in accordance with the apprenticeship standards and apprentice agreements under which he or she is training, or in accordance with the rules and regulations of the California Apprenticeship Council.

**.2** Employment of Apprentices. Contractor agrees to comply with the requirements of Labor Code §1777.5. The Contractor awarded the Project, or any Subcontractor under him or her, when performing any of the Work under the Contract or subcontract, employs workers in any apprentice-able craft or trade, the Contractor and Subcontractor shall employ apprentices in the ratio set forth in Labor Code §1777.5. The Contractor or any Subcontractor must apply to any apprenticeship program in the craft or trade that can provide apprentices to the Project site for a certificate approving the contractor or subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, the decision of the apprenticeship program to approve or deny a certificate shall be subject to review by the Administrator of Apprenticeship. The apprenticeship program or programs, upon approving the Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or Subcontractor upon the Contractor's or Subcontractor's request. "Apprentice-able craft or trade" as used in this Article means a craft or trade determined as an apprentice-able occupation in accordance with the rules and regulations prescribed by the California Apprenticeship Council. The ratio of work performed by apprentices to journeyman employed in a particular craft or trade on the Project shall be in accordance with Labor Code §1777.5.

**.3** Submission of Contract Information. Prior to commencing Work on the Project, the Contractor and Subcontractors shall submit contract award information to the applicable apprenticeship program(s) that can supply apprentices to the Project and make the request for the dispatch of apprentices in accordance with the Labor Code. The information submitted shall include an estimate of journeyman hours to be performed under the Contact, the number of apprentices proposed to be employed, and the approximate dates the apprentices would be employed. A copy of this information shall also be submitted to the Owner if requested. Within 60 days after concluding Work on the Project, the Contractor and Subcontractors shall submit to the Owner, if requested, and to the apprenticeship program a verified statement of the journeyman and apprentice hours performed on the Project.

**.4** Apprentice Fund. The Contractor or any Subcontractor under him or her, who, in performing any of the Work under the Contract, employs journeymen or apprentices in any apprentice-able craft or trade shall contribute to the California Apprenticeship Council the same amount that the Director determines is the prevailing amount of apprenticeship training contributions in the area of the Project. The Contractor and

Subcontractors may take as a credit for payments to the California Apprenticeship Council any amounts paid by the Contractor or Subcontractor to an approved apprenticeship program that can supply apprentices to the Project. The Contractor and Subcontractors may add the amount of the contributions in computing his or her bid for the Contract.

**.5** Prime Contractor Compliance. The responsibility of compliance with Article 13 and §1777.5 of the Labor Code for all apprentice-able occupations is with the Prime Contractor. Any Contractor or Subcontractor that knowingly violates the provisions of this Article or Labor Code §1777.5 shall be subject to the penalties set forth in Labor Code §1777.7.

**.8 Bonding:** The contractor shall provide a Statutory Payment Bond covering the full value of the Contract.

**13.8 RECORD OF WAGES PAID**

**13.8.1 Application of Labor Code:** Pursuant to section 1776 of the Labor Code:

**.1** Each Contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, and straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that is made under penalty of perjury, stating both of the following:

**.1** The information contained in the payroll record is true and correct.

**.2** The employer has complied with the requirements of sections 1771, 1811 and 1815 for any work performed by his or her employees on the public works project.

**.2** The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

**.1** A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

**.2** A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the Owner and the Division of Labor Standards Enforcement of the Department of Industrial Relations ("DIR"). The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner monthly or more frequently, if so specified in the Agreement and in a format the Labor Commissioner prescribes.

**.3** A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the Owner or the Division of Labor Standards Enforcement of the DIR. If the requested payroll records have not been provided pursuant to Section (2), the requesting party shall, prior to being provided the records, reimburse the costs of the preparation by the contractor, subcontractors, and the entity through which the request was made. The public may not be given access to such records at the principal office of the Contractor.

**.3** Unless required as of January 1, 2015, to be furnished directly to the Labor Commissioner under Labor Code section 1771.4(a)(3), the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement of the DIR or shall contain the same information as the forms provided by the division. The payroll records may consist of printouts of payroll data that are maintained as computer records, if the printouts contain the same information as the forms provided by the division and the printouts are verified in the manner specified in (a) above.

**.4** A Contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested such records within 10 days after receipt of a written request.

**.5** Except as provided in subdivision (f), any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body or the Division of Labor Standards Enforcement of the DIR shall be marked or obliterated to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor awarded the Contract or the subcontractor performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a multi-employer Taft-Hartley trust fund (29 U.S.C. Sec. 186(c)(5) that requests the records for the purposes of allocating contributions to participants shall be marked or obliterated only to prevent disclosure of an individual's full social security number, but shall provide the last four digits of the social security number. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation

Act of 1978 (29 U.S.C. Sec. 175a) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

**.6** Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided non-redacted copies of certified payroll records. Any copies of records or certified payroll made available for inspection and furnished upon request to the public by an agency included in the Joint Enforcement Strike Force on the Underground Economy or to a law enforcement agency investigating a violation of law shall be marked or redacted to prevent disclosure of an individual's name, address, and social security number. An employer shall not be liable for damages in a civil action for any reasonable act or omission taken in good faith in compliance with this subsection.

**.7** The contractor shall inform the Owner of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

**.8** The contractor or subcontractor has 10 days in which to comply subsequent to receipt of written notice requesting the records enumerated in subdivision (a). If the Contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit one hundred dollars ($100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement of the DIR, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of the subcontractor to comply with this section.

**13.9 APPRENTICES**

**13.9.1 Apprentice Wages and Definitions:** All apprentices employed by the Contractor to perform services under the Contract shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed only at the work of the craft or trade to which he or she is registered. Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprenticeship agreements under Chapter 4 (commencing with §3070) of Division 3, are eligible to be employed under this Contract. The employment and training of each apprentice shall be in accordance with the apprenticeship standards and apprentice agreements under which he or she is training.

**13.9.2 Apprentice Labor Pool:** When the Contractor to whom the Contract is awarded by the Owner, or any Subcontractor under him or her, in performing any of the Work under the Contract or subcontract, employs workers in any apprenticeable craft or trade, the Contractor and Subcontractor shall apply to the joint apprenticeship committee administering the apprenticeship standards of the craft or trade in the area of the Site of the Project, for a certificate approving the Contractor or Subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, approval as established by the joint apprenticeship committee or committees shall be subject to the approval of the Administrator of Apprenticeship. The joint apprenticeship committee or committees, subsequent to approving the subject Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or Subcontractor in order to comply with this section. Every Contractor and Subcontractor shall submit the contract award information to the applicable joint apprenticeship committee which shall include an estimate of journeyman hours to be performed under the Contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed. There shall be an affirmative duty upon the joint apprenticeship committee or committees administering the apprenticeship standards of the crafts or trade in the area of the Site of the public work, to ensure equal employment and affirmative action and apprenticeship for women and minorities. Contractors or Subcontractors shall not be required to submit individual applications for approval to local joint apprenticeship committees provided they are already covered by the local apprenticeship standards. The ratio of work performed by apprentices to journeymen, who shall be employed in the craft or trade on the Project, may be the ratio stipulated in the apprenticeship standards under which the joint apprenticeship committee operates, but, except as otherwise provided in this section, in no case shall the ratio be less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman. However, the minimum ratio for the land surveyor classification shall not be less than one (1) apprentice for each five (5) journeymen.

**13.9.3 Journeyman/Apprentice Ratio; Computation of Hours:** Any ratio shall apply during any day or portion of a day when any journeyman, or the higher standard stipulated by the joint apprenticeship committee, is employed at the job Site and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the land surveyor classification. The Contractor shall employ apprentices for the number of hours computed as above before the end of the Contract. However, the Contractor shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the job Site. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a joint apprenticeship committee, may order a minimum ratio of not less than one (1) apprentice for each five (5) journeymen in a craft or trade classification.

**13.9.4 Journeyman/Apprentice Ratio:** The Contractor or Subcontractor, if he or she is covered by this section upon the issuance of the approval certificate, or if he or she has been previously approved in the craft or trade, then shall employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the apprenticeship standards. Upon proper showing by the Contractor that he or she employs apprentices in the craft or trade in the state on all of his or her contracts on an annual average of not less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman, or in the land surveyor classification, one (1) apprentice for each five (5) journeymen, the Division of Apprenticeship Standards may grant a certificate exempting the Contractor from the 1-to-5 hourly ratio as set forth in this section. This section shall not apply to contracts of general contractors or to contracts of specialty contractors not bidding for work through a general or prime contractor, when the contracts of general contractors or those specialty contractors involve less than Thirty Thousand Dollars ($30,000) or twenty (20) working days. Any work performed by a journeyman in excess of eight (8) hours per day or forty (40) hours per week, shall not be used to calculate the hourly ratio required by this section.

**.1 Apprenticeable Craft or Trade:** "Apprenticeable craft or trade" as used in this Article means a craft or trade determined as an apprenticeable occupation in accordance with the rules and regulations prescribed by the California Apprenticeship Council. The joint apprenticeship committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting a Contractor from the 1-to-5 ratio set forth in this Article when it finds that any one of the following conditions is met:

- **.1** Unemployment for the previous three-month period in the area exceeds an average of fifteen percent (15%).
- **.2** The number of apprentices in training in such area exceeds a ratio of 1-to-5.
- **.3** There is a showing that the apprenticeable craft or trade is replacing at least one-thirtieth (1/30) of its journeymen annually through the apprenticeship training, either on a statewide basis or on a local basis.
- **.4** Assignment of an apprentice to any work performed under this contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.

**13.9.5 Ratio Exemption:** When exemptions are granted to an organization which represents Contractors in a specific trade from the 1-to-5 ratio on a local or statewide basis, the member Contractors will not be required to submit individual applications for approval to local joint apprenticeship committees, if they are already covered by the local apprenticeship standards.

**13.9.6 Apprentice Fund:** A Contractor to whom the Contract is awarded or any Subcontractor under him or her, who, in performing any of the work under the Contract, employs journeymen or apprentices in any apprentice-able craft or trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the site of the Project, to which fund or funds other contractors in the area of the site of the Project are contributing, shall contribute to the fund or funds in each craft or trade in which he or she employs journeymen or apprentices on the Project in the same amount or upon the same basis and in the same manner as the other contractors do, but where the trust fund administrators are unable to accept the funds, contractors not signatory to the trust agreement shall pay a like amount to the California Apprenticeship Council. The Contractor or Subcontractor may add the amount of the contributions in computing his or her bid for the contract. The Division of Labor Standards Enforcement is authorized to enforce the payment of the contributions to the fund or funds as set forth in the Labor Code section 227.

**13.9.7 Prime Contractor Compliance:** The responsibility of compliance with section 13.10 and section 1777.5 of the Labor Code for all apprentice-able occupations is with the Contractor.

**13.9.8 Decisions of Joint Apprenticeship Committee:** All decisions of the joint apprenticeship committee under this section 13.10 and Labor Code section 1777.5 are subject to Labor Code section 3081.

**13.9.9 No Bias:** It shall be unlawful for an employer or a labor union to refuse to accept otherwise qualified employees as registered apprentices on any public works on the grounds of race, religious creed, color, national origin, ancestry, sex, or age, except as provided in the Labor Code section 3077.

**13.9.10 Violation of Labor Code:** Pursuant to Labor Code section 1777.1, if a Contractor or Subcontractor willfully fails to comply with the provisions of this section 13.10 and Labor Code section 1777.5, among other things:

**.1** The Labor Commissioner may deny to the contractor or subcontractor, and to its responsible officers, the right to bid on, or be awarded or perform work as a subcontractor on, any public works project for a period of up to one year for the first violation and for a period of up to three years for the second and subsequent violation. Each period of debarment shall run from the date the determination of noncompliance by the Labor Commissioner becomes a final order.

**.2** A contractor or subcontractor who violates section 1777.5 shall forfeit as a civil penalty an amount not exceeding the sum of one hundred dollars ($100) for each full calendar day of noncompliance. Upon receipt of a determination that a civil penalty has been imposed, the awarding body shall enforce the penalty, which includes withholding the amount of the civil penalty from the contract progress payments or retention then due or to become due.

**.3** In lieu of the penalty provided, the Labor Commissioner may for a first time violation and with the concurrence of an applicable apprenticeship program, order the contractor or subcontractor to provide apprentice employment equivalent to the work hours that would have been provided for apprentices during the period of noncompliance.

**.4** Any funds withheld by the awarding body pursuant to this section shall be deposited in the General Fund.

**.5** The interpretation and enforcement of section 1777.5 and this section shall be in accordance with the regulations of the California Apprenticeship Council.

**.6** Pursuant to Public Contract Code section 6109, no contractor or subcontractor may bid on, be awarded, or perform work as a subcontractor on a public works project if ineligible to bid or work on, or be awarded, a public works project pursuant to section 1777.1 of the Labor Code.

**13.10 ASSIGNMENT OF ANTITRUST CLAIMS**

**13.10.1 Application:** Pursuant to Public Contract Code section 7103.5 and Government Code section 4552, in entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the Owner 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. §15) or under the Cartwright Act (Chapter 2 [commencing with §16700] of Part 2 of Division 7 of the Bus. & Prof. Code), arising from the purchase of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the Owner tenders Final Sublease Payment to the Contractor, without further acknowledgment by the parties. If the Owner receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under Chapter 11 (commencing with § 4550) of Division 5 of Title 1 of the Government Code, then the assignor may, upon demand, recover from the Owner any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the Owner as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

**13.10.2 Assignment of Claim:** Upon demand in writing by the assignor, the Owner shall, within one (1) year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose and the Owner has not been injured thereby or the Owner declines to file a court action for the cause of action.

**13.11 AUDIT**

Pursuant to and in accordance with the provisions of Government Code section 8546.7, or any amendments thereto, all books, records, and files of the Owner, the Contractor, or any Subcontractor connected with the performance of this Contract involving the expenditure of state funds in excess of Ten Thousand Dollars ($10,000.00), including, but not limited to, the administration thereof, shall be subject to the examination and audit of the Office of the Auditor General of the State of California for a period of three (3) years after release of all retention under this Contract. Contractor shall preserve and cause to be preserved such books, records, and files for the audit period. During the progress of the Work and for three (3) years after release of all retention under the Contract, Owner shall also have the right to an audit, and Contractor must cooperate by producing all information requested within seven (7) days.

**13.12 STORM WATER DISCHARGE PERMIT**

If applicable, the Contractor shall file a Notice of Intent to comply with the terms of the general permit to discharge storm water associated with construction activity (WQ Order No. 920-08-DWQ). The Notice of Intent must be sent to the following address along with the appropriate payment (warrant to be furnished by the Owner upon request by the Contractor, allow warrant processing time.): California State Water Resources Control Board, Division of Water Quality, Storm Water Permit Unit, P.O. Box 1977, Sacramento, CA 95812-1977. The Contractor may also call the State Water Board's Construction Activity Storm Water Hotline at (916) 657-1146. The Notice of Intent shall be filed prior to the start of any construction activity.

**14.1.1** **Delete** Section 14.1.1 and related subsections in their entirety and **substitute** the following:

**14.1.1** The Contractor may not terminate the Contract for convenience. The Contractor may terminate for cause if the Work is stopped by others for a period of 180 consecutive days through no act or fault of the Contractor, a Subcontractor of any tier, their agents or employees, or any other persons performing portions of the Work for whom the Contractor is contractually responsible, and the Work was stopped by others for one of the following reasons: (1) Issuance of an order of a court or other public authority having jurisdiction which requires Owner to stop all Work; (2) an act of government, such as a declaration of national emergency, making material unavailable which requires Owner to stop all Work, (3) because the Architect has not issued a certificate for payment and not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or (4) because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents. If such grounds exist, then the Contractor may serve written notice of such grounds on Owner and demand a meet-and-confer conference to negotiate a resolution in good faith within 20 days of Owner's receipt of such notice. If such conference does not lead to resolution and the grounds for termination still exist, then Contractor may terminate the Contract and recover from the Owner payment for Work executed and for reasonable verified costs with respect to materials, equipment, tools, construction equipment, and machinery, including reasonable overhead, profit, and damages for the Work executed, but excluding overhead (field and home office) and profit for (1) Work not performed and (2) the period of time that the Work was stopped.

**14.2.1** **Delete** Section 14.2.1 and related subsections in their entirety and **substitute** the following:

**14.2.1** The Owner may terminate the Contract if the Contractor:

**.1** Refuses or fails to supply enough properly skilled workers or proper materials, or refuses or fails to take steps to adequately prosecute the work toward completion within the Contract Time;

**.2** Fails to make payment to Subcontractors for materials or labor in accordance with Public Contract Code section 10262 or Business and Professions Code section 7108.5, as applicable;

**.3** Disregards laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction;

**.4** Violates Labor Code section1771.1(a), subject to the provisions of Labor Code section 1771.1(f); or

**.5** Otherwise is in breach of the Contract Documents.

**Delete Article 15 in its entirety and substitute the following:**

**ARTICLE 15 POTENTIAL CHANGE, CHANGE ORDER REQUESTS, CLAIMS AND DISPUTES**

**15.1 NOTICE OF POTENTIAL CHANGE**

**15.1.1 Potential Changes:** If the Contractor identifies the potential for extra work, delay in the critical path schedule, or the need for additional money or time, or if the Contractor requests additional money or time, or if the Contractor believes that the Owner has failed to pay amounts due or otherwise breached the Contract, or otherwise believes that it is entitled to a modification of the Contract terms and conditions, then Contractor shall follow the procedures in this Article 15 and Articles 7 and 8, otherwise the Contractor shall have waived its rights to pursue those issues and any later attempts to recover money or obtain a modification shall be barred. The Contractor specifically acknowledges the Owner's and public's interest in, and need to know of, potential changes and disputes as early as possible so the Owner can investigate, mitigate and resolve adverse cost and time impacts, if any. It is the Contractor's obligation to know and comply with the requirements of this Article 15 and Articles 7 and 8, and Owner has no obligation to notify Contractor of any failure to comply with those requirements.

**15.1.2 Notice of Potential Changes:** Contractor shall submit a written Notice of Potential Change for extra work, critical path delay, or additional money or time. Contractor shall submit written Notices of Potential Change to Owner within five (5) days of Contractor becoming aware of the issues creating the potential for change, unless the issues are, or may soon be, adversely affecting the costs or critical path of the Work, in which case the Contractor must submit the written notice without delay so the Owner may take immediate action to mitigate cost and schedule impacts of the change, if any. The written notice shall explain the nature of the potential change so the Owner may take action to mitigate costs and schedule impacts, if necessary.

**.1** When submitting a written Notice of Potential Change based on extra work, Contractor shall not perform the extra work until directed in writing to do so by Owner. When submitting a written Notice of Potential Change for an issue of critical path delay, Contractor shall proactively mitigate the effects of the alleged delay as much as reasonably possible so as to minimize any impact to the schedule, until otherwise directed by Owner. If Contractor intends to rely on Owner's acts or omissions in support of a request for a time extension, then Contractor must also provide the notice set forth in Article 8.3.

**.2** Failure to timely submit a written Notice of Potential Change shall constitute a complete waiver by Contractor of any right to later submit a change order request or pursue a Claim on that issue, or to later pursue any additional money or time extensions in any manner related to that issue, regardless of the merits, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Contractor acknowledges that these written notices are of critical importance to the Owner's Project management and the mitigation of Project costs and delays.

**15.2 CHANGE ORDERS REQUESTS**

**15.2.1** If, after submitting a written Notice of Potential Change pursuant to Section 15.1, the Contractor continues to believes that it is entitled to additional money or time (including, but not limited to, grant of a time extension; payment of money or damages arising from work done by or on behalf of the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or an amount the payment of which is disputed by the Owner) based on an issue, then the Contractor shall submit a Change Order Request to the Owner within twenty (20) days of (1) becoming aware of the issues creating a potential change, or (2) the date by which it should have become aware of the issues creating a potential change. A rejection at any time or a lack of a rejection by Owner of a Notice of Potential Change does not affect the timeline for submitting a Change Order Request.

**15.2.2** Failure to timely submit a Change Order Request related to an issue, or failure to comply with any of the Change Order Request requirements in the Contract shall constitute a complete waiver by Contractor of any right to later submit a Change Order Request or Claim on that issue, or to later pursue any additional money (including time extensions) in any manner related to that issue, regardless of the merits, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**15.2.3** The Change Order Request shall state the grounds for the additional money or time requested and the amount of money or time requested and include all information supporting the Change Order Request. When a time extension is requested, the Contractor shall submit a time impact analysis with the Change Order Request showing the influence of the change or delay on the Contract Completion Date.

**15.2.6** The Owner may accept the entire Change Order Request, accept part of the Change Order Request and reject the remainder, reject the entire Change Order Request, or request additional information. If the Owner does not respond within thirty (30) days by accepting the entire Change Order Request, accepting part of the Change

Order Request and rejecting the remainder, or requesting additional information, then the entire Change Order Request shall be deemed rejected as of the thirtieth (30th) day. If the Owner requests additional information, then the Contractor shall submit the information within fifteen (15) days of the date of the request and the Owner shall have fifteen (15) days after the receipt of the additional information to accept or reject (in whole or in part) the Change Order Request. If the Owner fails to respond within fifteen (15) days after the submission of additional information, then the entire Change Order Request shall be deemed rejected as of the fifteenth (15th) day.

**15.3 CLAIMS**

**15.3.1 Definition of Claim:** A "Claim" is a separate demand by the Contractor for (1) a time extension, (2) payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by the Owner. A claim includes any claim within the scope of Public Contract Code Section 20104 et seq. Resubmittal in any manner of a Change Order Request which was previously rejected under Section 15.2 constitutes a Claim, whether the Change Order Request was rejected in whole or in part, and whether the Change Order Request was rejected expressly or deemed rejected by Owner inaction. A Claim includes any dispute the Contractor may have with the Owner, including one which does not require a Notice of Potential Change or Change Order Request under Sections 15.1 and 15.2, and includes an alleged breach of contract by the Owner. A Claim under this Section 15.3 shall also constitute a claim for purposes of the California False Claims Act. If there is a conflict between a Claims provision in Division 1 of the Specifications and this Article 15, then this Article 15 shall take precedence.

**.1** The Notice of Potential Change and Change Order Request procedures above are less formal procedures which precede the more formal Claim. A Notice of Potential Change does not constitute a Claim. A Change Order Request does not constitute a Claim; except that if insufficient time remains before the Claim deadline set forth in Section 15.3.3 for Contractor to submit a Change Order Request and for Owner to process and reject the Change Order Request under Section 15.2, then either (1) Contractor may submit a Change Order Request which Owner shall treat as a Claim, but only if the Change Order Request complies with all requirements in this Section 15.3 and Articles 7 and 8 for Change Order Request's and Claims, or (2) a Change Order Request is not required so long as a Claim complying with this Article 15 is timely submitted.

**.2** A Claim does not include vouchers, invoices, payment applications, or other routine or authorized forms of requests for payments on the Contract; however, those documents remain "claims" for purposes of the California False Claims Act. A Claim does not include a Government Code Claim. ("Government Code Claim" means a claim under Government Code Sections 900 et seq. and 910 et seq.)

**.3** A Claim may not include any costs incurred in preparation of the Claim or in preparation of any underlying Change Order Request, including, but not limited to, costs of delay analysis.

**15.3.2 Continuing Contract Performance:** Pending final resolution of a Claim, except as otherwise agreed in writing or as provided under Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract as directed by Owner, and the Owner shall continue to make any undisputed payments in accordance with the Contract.

**15.3.3 Time for Submitting Claim:** The Contractor shall submit a Claim to the and Owner on or before the date of the Final Payment. The Owner's rejection, or lack of rejection, of a Change Order Request at any time does not affect the deadline for filing a Claim.

**.1** In addition, before the date of the Final Payment based on 100% completion of the work, Contractor shall submit to Owner, in writing, a summary of all Claims for money or time extensions under or arising out of this Contract which were timely filed and which were fully compliant with the Contract's requirements for Claims. The Owner's making of the Final Payment shall constitute a complete waiver of all Claims against the Owner under or arising out of this Contract, except those identified in the above summary, as the Contractor will not have satisfied a condition precedent or exhausted administrative remedies. This Claim summary requirement shall not extend the time for submitting a Claim.

**.2** Failure to timely submit a Claim, failure to include a Claim in the Claim summary, or failure to comply with any of the Claim requirements in the Contract, including, but not limited to, this Article 15, will act as a complete waiver of Contractor's rights to (1) recover money or time on the issues for which a Claim was required, (2) submit a Government Code Claim for the money or time (see Sections 15.4 and 15.5), and (3) initiate any action, proceeding or litigation for the money or time, regardless of the merits, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies. The Owner does not have an obligation

to reject the Claim for a failure to comply with any of the Claim requirements in the Contract, including the lack of certification, and any failure by the Owner to reject, or any delay in rejecting, a Claim on that basis does not waive the Owner's right to reject the Claim on that basis at a later time. In no event may the Contractor reserve its rights to assert a Claim for a time extension or additional money beyond the time set forth in Section 15.3.2 unless the Owner agrees in writing to allow the reservation.

**15.3.4 Content of Claims:** All claims shall be in writing. All claims for additional cost or time shall be stated and itemized in the Claim at the time submitted. The responsibility to substantiate Claims shall rest with the Contractor. Claims shall be submitted with adequate supporting documentation which includes, but is not limited to the following:

**.1** A statement of the reasons for the asserted entitlement, identifying primary, secondary, and indirect claim issues;

**.2** Identification of contract clauses under which the claim is being presented;

**.3** A written analysis as to (1) why the claimed cost was incurred, (2) why Contractor could not mitigate its costs, (3) why the claimed cost is the responsibility of the Owner, and (4) why the claimed cost is a reasonable amount.

**.4** Cost impact statement for each claim issue with an itemized breakdown for any adjustment sought, including copies of the original subcontractor invoices or cost statements, certified payroll, invoices for material, invoices for equipment rental, and other data required to substantiate costs claimed.

**.5** Time impact statement for each claim issue with a written time impact analysis illustrating the influence of each change on the current scheduled completion date in accordance with other scheduling requirements of these Contract Documents.

**.6** The Contractor shall certify, at the time of submission of a claim, as follows:

I, [name of declarant], declare that [Contractor company name] has contracted with [public entity name] for the [name of project] Project. ([Contractor company name]) authorized me to prepare the attached Claim for money and/or time extension) for [public entity name] regarding this Project (dated _____, 20__, entitled _____, and requesting $_____ and/or ___ additional days), and I prepared the attached Claim. I am the most knowledgeable person at [contractor company name] regarding this Claim.

The attached Claim complies with all laws applicable to submission of a Claim, including, but not limited to, California Penal Code section 72, Government Code sections 12650 et seq. (False Claims Act), and Business and Professions Code sections 17200 et seq. (Unfair Business Practices Act). I am aware that submission or certification of false claims, or other claims that violate law or the Contract, may lead to fines, imprisonment, and/or other serious legal consequences for myself or [contractor company name].

The attached Claim does not breach the Contract between [contractor company name] and [public entity name] for this Project, is not a false claim, does not violate any applicable law, satisfies all provisions of the Contract applicable to submission of the Claim, only contains truthful and accurate supporting data, and only requests additional costs /or additional time that accurately reflects the adjustments to cost and time for which I believe that [public entity name] is responsible under its Contract with [contractor company name].

While preparing this declaration and Claim I consulted with others (including attorneys, consultants, or others who work for [Contractor company name]) when necessary to ensure that the statements were true and correct.

The Contactor understands and agrees that any Claim submitted without this certification does not meet the terms of the Contract Documents; that the Owner, or Owner's representatives, may reject the Claim on that basis; and that unless the Contractor properly and timely files the Claim with the certification, the Contractor cannot further pursue the Claim in any forum and all rights to additional money or time for the issues covered by the Claim are waived due to a condition precedent not having been satisfied.

I declare under the penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed _____, 2___, at _____, California.

By: _____
(Name, title and signature of Declarant)

**.7** Claims submitted without adequate supporting documentation or certification will be rejected.

**.8** Submission of a Claim, properly certified, with all required supporting documentation, and written rejection or denial of all or part of the Claim by the Owner, is a condition precedent to any action, proceeding, litigation, or suit by the Contractor.

**.9** The Contractor's failure to timely submit a certification will constitute a complete waiver of Contractor's rights to (1) recover money or time on the issues for which a Claim was required, (2) submit a Government Code Claim (see Section 15.3.8.4) for the money or time, and (3) initiate any action, proceeding or litigation for the money or time, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**15.3.5 Claims for Additional Cost:** If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provide herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. In no event will the Contractor be allowed to reserve its rights to assert a Claim for additional cost at a later time, unless the Owner expressly agrees in writing to allow the reservation. Any costs, direct or indirect, not asserted shall be waived.

**15.3.6 Claims for Additional Time:** If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provide herein shall be given. The Claim shall include, but not be limited to, all facts supporting the Claim, all documentation of such facts, all information required by the Contract Documents, and a current schedule and delay analysis explaining (1) the nature of the delay, (2) the Owner's responsibility for the claimed delay, (3) the claimed delay's impact on the critical path, (4) the claimed delay's impact on completion date (including an analysis of any float still remaining and whether the alleged delay in work exceeds such remaining float), and (5) why Contractor could not mitigate the delay impacts. In the case of a continuing delay, only one initial Claim is necessary that is based on estimates of when the continuing delay will end, but within thirty (30) days of the end of the continuing delay an updated final Claim must be submitted, which shall also be certified. In no event will the Contractor be allowed to reserve its rights to assert a Claim for a time extension, unless the Owner expressly agrees in writing to allow the reservation. Any time extension not asserted shall be waived.

**15.3.6.1 Unusually Severe Weather Conditions:** If unusually severe weather is the basis for a Claim for additional time, then Contractor must provide Owner data and facts showing that the weather conditions were abnormal for the period of time, could not have been reasonably anticipated or mitigated, and had an adverse effect on the critical path of the scheduled construction.

**.1** The Contractor shall reasonably anticipate that normal weather conditions will be encountered. No extension of time will be granted for normal weather conditions. Normal weather conditions shall be defined as the average days per month in which 0.10" or more of precipitation occurs, based upon the weather data from the Western Regional Climate Center, National Weather Service, for Visalia, Porterville, Hanford, Fresno, Madera, California. Average precipitation days per month are as follows:

| Month | Coalinga | Delano | McFarland | Hanford | Lemoore | Visalia | Los Banos | Fresno / Sanger | Madera | Porterville | Lemon Cove | Lindsay | Merced | Three Rivers | Springville |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 6 |
| February | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 |
| March | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 6 | 6 |
| April | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 5 |
| May | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| June | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| August | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| September | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| October | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| November | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 5 |
| December | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 6 |
| **Total:** | **20** | **20** | **20** | **21** | **21** | **24** | **25** | **26** | **26** | **26** | **27** | **27** | **30** | **35** | **40** |

**.2** Final determination of the final impact of adverse weather may be deferred to the conclusion of the Work. Extensions of time may be requested for any month of construction for days lost, which affect the critical path of construction, due to adverse weather in excess of the normal weather conditions, as defined above.

**15.3.7 "Pass Through" Claims:** A Subcontractor or supplier to Contractor may not submit a request for additional time or cost directly to the Owner. If a subcontractor or supplier submits a request for additional cost or time to the Contractor and the Contractor wishes to pass it through to Owner, then the Contractor must comply with all requirements of Article 15, including Notices of Potential Change, Change Order Requests, and Claims. The Contractor must prepare and submit its own analysis of the Subcontractor's request, and the Claim must include a copy of the Subcontractor's request along with any other necessary supporting documentation.

**.1** The Contractor's analysis of the Subcontractor's request must include Contractor's detailed explanation as to why the Subcontractor or supplier's request is the Owner's responsibility, including Contractor's analysis of (1) why the amount of damages the Subcontractor or supplier requests is justified and appropriate, (2) how Contractor's breach of the subcontract caused the Subcontractor or supplier to incur these damages, and (3) how the Owner's breach of the Contract caused the Contractor's breach of the subcontract.

**.2** Any Contractor Claim that fails to include the above information, or that states that Owner is responsible for the Subcontractor's request only if that Contractor is found to owe money to Subcontractor, shall act as a complete waiver of Contractor's rights to (1) recover money or time on the issues for which a Claim was required, (2) submit a Government Code Claim (see Section 15.4.4) for the money or time, and (3) initiate any action, proceeding or litigation for the money or time, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**15.4 Procedures for Claims Less Than or Equal to $375,000 (Public Contract Code section 20104.2):** Claims less than or equal to $375,000 are subject to this section 15.4, as well as the separate procedures and substantive provisions of Sections 15.1 through 15.3.7.

**15.4.1 Claims for Less Than $50,000:** The Owner shall respond in writing to any written Claim within 45 days of receipt of the Claim, or may request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the claim the Owner may have against the Contractor.

**.1** If additional information is thereafter required, then it shall be requested and provided pursuant to this subsection, upon mutual agreement of the Owner and Contractor.

**.2** If Owner and the Contractor cannot reach mutual agreement, then the Contractor's failure to provide any reasonably-requested information within fifteen (15) days after the request shall act as a complete waiver of the Contractor's rights to (1) recover money or time on the issues for which a Claim was required, (2) submit a Government Code Claim (see Section 15.4.4) for the money or time, and (3) initiate any action, proceeding or litigation for such money or time, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**.3** The Owner's written response to the Claim, as further documented, shall be submitted to the Contractor within 15 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

**15.4.2 Claims Over $50,000 and Less Than or equal to $375,000:** The Owner shall respond in writing to all written Claims within 60 days of receipt of the Claim, or may request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim the Owner may have against the Contractor.

**.1** If additional information is thereafter required, then it shall be requested and provided pursuant to this subsection, upon mutual agreement of the Owner and the Contractor.

**.2** If the Owner and the Contractor cannot reach mutual agreement, then the Contractor's failure to provide any reasonably-requested information within thirty (30) days after the request shall act as a complete waiver of the Contractor's rights to (1) recover money or time on the issues for which a Claim was required, (2) submit a Government Code Claim (see Section 15.4.4) for such money or time, and (3) initiate any action, proceeding or litigation for such money or time, as the Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**.3** The Owner's written response to the Claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

**15.4.3 Meet and Confer:** If the Contractor disputes the Owner's written response, or the Owner fails to respond within the time prescribed, then the Contractor may so notify the Owner, in writing, either within 15 days of receipt of the Owner's response or within 15 days of the Owner's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the Owner shall schedule a meet and confer conference for settlement of the dispute, which shall take place within 30 days of the demand. Upon written agreement of the Owner and the Contractor, the conference may take place during regularly scheduled Project meetings.

**.1** If Contractor fails to timely notify the Owner that it wishes to meet and confer pursuant to the previous Section, then Contractor will have waived all rights to (1) recover money or time on the issues for which a Claim was required, (2) submit a Government Code Claim (see Section 15.4.4) for such cost or time, and (3) initiate any action, proceeding or litigation for such money or time, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**.2** If a Claim, or any portion of a Claim, over $100,000 remains in dispute after the meet and confer and the Contractor wishes to pursue it, then the Contractor must demand non-binding mediation in writing within fifteen (15) days. If the Contractor fails to timely notify the Owner in writing that it wishes to mediate pursuant to this Section, then the Contractor will have waived all right to further pursue the Claim pursuant to Section 15.3.3. The parties shall reasonably cooperate to schedule and attend a mediation as soon as reasonably possible.

**15.4.4 Government Code Claim:** If the Claim or any portion remains in dispute after the meet and confer conference and the Contractor wishes to pursue it, then the Contractor must file a timely and proper Government Code Claim. The filing of a Government Code Claim is specifically required in addition to all contractual procedures described in Sections 15.1 through 15.3.7. The above contractual procedures do not act as a substitute for the Government Code Claim process, and the two sets of procedures shall be sequential with the contractual procedures coming first.

**.1** Failure to timely file a Government Code Claim shall act as complete waiver of Contractor's rights to (1) recover money or time on the issues for which a Government Code Claim was required, and (2) initiate any action, proceeding or litigation for such money or time, as Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

**.2** The Owner and the Contractor shall proceed with the Government Code Claim according to Government Code, Section 900 et seq., and as otherwise permitted by law. For purposes of the applicable Government Code provisions, and as provided in Public Contract Code section 20104.2(e), the running of the time period within which a Contractor must file a Government Code Claim shall be tolled from the time the Contractor submits a written Claim under Section 15.3 until the time that the Claim is denied, in whole or in part, as a result of the meet and confer process in Section 15.4.3, including any period of time utilized by the meet and confer process.

**15.5 Procedures for Claims Over $375,000:** The Contractor and Owner shall proceed with Claims over $375,000 pursuant to Section 15.4, except as follows: (1) Section 15.4.1 shall not be applicable; (2) for Section 15.4.2, Owner shall respond in writing to all written Claims within 90 days of receipt of the Claim, or may request, in writing, within 45 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim the Owner may have against the Contractor; (3) for Section 15.4.2, the Owner shall respond within 45 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or documentation, whichever is greater; and (4) for Section 15.4.3, following the meet and confer conference, if the Claim or any portion of it remains in dispute and Contractor wishes to pursue it, the Contractor must demand in writing within fifteen (15) days that the parties mediate (non-binding). If the Contractor fails to timely notify the Owner in writing that it wishes to mediate pursuant to this Section, then the Contractor will have waived all rights to further pursue the Claim pursuant to Section 15.3.3. The parties shall reasonably cooperate to schedule and attend a mediation as soon as reasonably possible.

**15.6 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS**

**15.6.1 Trenches or Excavations Less Than Four Feet Below the Surface:** If Contractor encounters conditions at the Site which are subsurface or otherwise concealed physical conditions, which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then the Contractor shall give notice to the Owner promptly before conditions are disturbed and in no event later than ten (10) days after first observance of the conditions. If Contractor believes that such conditions differ materially and will cause an increase in the Contractor's cost of, time required for, or performance of any part of the Work, then Contractor must comply with the provisions above for Notice of Potential Change, Change Order Request, and Claims (beginning with Section 15.1).

**15.6.2 Trenches or Excavations Greater Than Four Feet Below the Surface:** Pursuant to Public Contract Code section 7104, when any excavation or trenching extends greater than four feet below the surface:

**.1** The Contractor shall promptly, and before the following conditions are disturbed, notify the Owner, in writing, of any (1) material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law; (2) subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids; or (3) unknown physical 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.

**.2** The Owner shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, then the Owner shall issue a change order under the procedures described in the Contract.

**15.6.3** If a dispute arises between the Owner and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, then the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

**15.7 Injury or Damage to Person or Property:** If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, any of the other party's employees or agents, or others for whose acts such party is legally liable, then written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. For a Notice of Potential Change, Change Order Request and Claim for additional cost or time related to this injury or damage, Contractor shall follow this Article 15.

END OF SECTION 00 7310

**SECTION 00 9110 - ADDENDA**

**1.** In accordance with Section 4-338(a) of the California Administrative Code, 2022 Edition, changes or alterations of the approved plans and specifications prior to the letting of a construction contract for the Work shall be made by means of addenda, which shall be submitted to and approved by Division of the State Architect (DSA) prior to distribution to contractors.

**2.** Addenda shall be stamped and signed by the Architect or Engineer in general responsible charge of preparation of the plans and specifications, and by the Architect or Engineer delegated responsibility for the portion affected by the addenda.

**3.** Addenda issued during bidding, if any, will be inserted following this page in the Contract Documents sets issued for construction.

**4.** The provisions of all Addenda shall become part of the Contract Documents and Contractor shall be obligated to construct the Project in accordance with the Contract Documents as modified or supplemented by the addenda provisions.

**END OF SECTION 00 9110**

**SECTION 01 1100 - SUMMARY OF WORK**

**PART 1 - GENERAL**

1.1 SUMMARY:

A. Related Sections: Close coordination between this Section, the General and Supplementary Conditions, and Divisions 1 through 33 is required.

B. Project Location: 300 Monroe Drive, Hanford, 93230

C. Project: The Project consists of the total construction of which the Work performed under the Contract Documents is a part and which may include construction by the Owner or by separate contractors, for:

**MODERNIZATION AT MONROE ELEMENTARY SCHOOL**

D. Work: The Work of the Project consists of all labor, material, equipment, and services to perform all selective demolition and construction required by the Contract Documents, including but not limited to alterations to (6) existing classroom buildings and miscellaneous site work for accessibility upgrades and site improvements including overhaul of existing service yard, relocation of (1) existing relocatable building, disconnecting and safe-off of (5) existing relocatable buildings, abandonment of existing irrigation well, and connection of new water main line and meter.

E. Applicable Codes: All work shall be performed in accordance with the plans, specifications and the following regulations:
1. 2025 Building Standards Administrative Code, Part 1, Title 24 CCR.
2. 2022 California Building Code (CBC), Part 2, Title 24 CCR.
3. 2022 California Electrical Code (CEC), Part 3, Title 24 CCR.
4. 2022 California Mechanical Code (CMC) Part 4, Title 24 CCR.
5. 2022 California Plumbing Code (CPC), Part 5, Title 24 CCR.
6. 2022 California Energy Code (CEC), Part 6, Title 24 CCR.
7. 2022 California Fire Code, Part 9, Title 24 CCR.
8. 2022 California Green Building Standards Code (CALGreen), Part 11, Title 24 CCR.
9. 2022 California Referenced Standards, Part 12, Title 24 CCR.
10. Title 19 CCR, Public Safety, State Fire Marshal Regulations.
11. 2022 NFPA 72 National Fire Alarm Code, as amended.

F. Conflicts in the Drawings and Specifications:
1. When conflicts are noticed prior to bidding, the bidder shall notify the architect immediately in order that an addendum can be issued to all bidders prior to bidding. When the discrepancy is noticed after the bid, the architect shall be notified and will review the discrepancy and interpret the intent. For the purpose of bidding and interpreting, **the most restrictive and potentially most expensive condition may prevail.**
2. In the case of ambiguity, conflict, or lack of information, the Architect shall respond with reasonable promptness and provide additional instructions, by means of drawings and/or written instructions, as may be otherwise necessary for proper execution of the work. All such drawings and instructions shall be consistent with the contract documents, true developments thereof, and reasonably inferable therefrom.

1.2 DIVISION OF THE STATE ARCHITECT REQUIREMENTS

A. Addenda: Changes or alterations of approved plans or specifications that affect structural, fire/life safety, or accessibility portions of the Project prior to letting a construction contract shall be made by means of addenda submitted to and approved by DSA in accordance with Section 4-338, California Administrative Code, Title 24,

Part 1, California Code of Regulations.

B. Changes: Changes or alterations of approved plans or specifications that affect structural, fire/life safety, or accessibility portions of the Project after a contract for the work has been let shall be made by means of Construction Change Documents submitted to and approved by DSA in accordance with Section 4-338, California Administrative Code, Title 24, Part 1, California Code of Regulations.
   1. Refer to Section 01 2600 for modification procedures.

C. Intent of the Contract Documents:
   1. The intent of the Drawings and Specifications is that the Work of alteration, rehabilitation, or reconstruction shall be in accordance with Title 24, California Code of Regulations.
   2. Should any existing conditions such as deterioration or non-complying conditions be discovered which is not covered by the Contract Documents, wherein the finished work will not comply with Title 24, California Code of Regulations, a Construction Change Document or separate set of Drawings and Specifications, detailing and specifying the work shall be submitted to and approved by DSA prior to proceeding with the Work.
      a. Refer to Section 01 2600 for modification procedures.

1.3 CONTRACTS

A. All work of this project will be let as a single lump sum General Contract.

1.4 FEES AND PERMITS

A. The Owner will be responsible to obtain and pay for the following:
   1. DSA approval and field inspection fee.

B. The Contractor shall be responsible to obtain and pay for the following:
   1. Permits and licenses required for work performed in the public right-of-way.
   2. Permits, licenses, and inspection fees required for execution and completion of the Work which are not the responsibility of the Owner.
   3. Permits and inspection fees required abandonment of irrigation well.

C. The Contractor shall be responsible for requesting all inspections required by the governing jurisdictions.

1.5 FUTURE WORK

A. Route all underground utilities a minimum of 10'-0" away from all building footprints identified as future construction.

B. Construct building pads for future buildings as indicated, grading top of pad to provide for drainage.

1.6 WORK SEQUENCE

A. Refer to Section 00 3100 for preliminary schedule requirements.
B. Construct the Work within the following constraints:
   1. Fire Department Requirements: Maintain access to existing hydrants and maintain existing fire lanes free of obstruction.
   2. Finish Flooring Installation: Complete enclosure of interior spaces, make HVAC system operational, and bring interior spaces to design temperature and humidity 48 hours prior to vapor emission control treatment pre-testing as specified in Section 09 6110.

1.7 CONTRACTOR'S USE OF PREMISES

A. Limit use of the site to construction activities in the areas indicated.

B. Confine operations to areas within the Contract Limits indicated. Portions of the site beyond areas in which construction operations are indicated shall not be disturbed.

C. Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.

D. Keep driveways and entrances serving the premises clear and available at to the Owner, the Owner's employees, and the public at all times.

E. Keep bus lanes and drop-off zones clear and available to the Owner at all times.

F. Use of existing toilets within the existing buildings, by the Contractor, shall not be permitted.

G. Store and stockpile materials on the property, excluding public rights-of-way.

1.8 OWNER OCCUPANCY

A. Owner intends to occupy the Project by the date stated in the Agreement as the Contract Completion Date.

B. Owner intends to continue to occupy adjacent portions of the existing site and/or buildings during the entire construction period. Do not interfere with the Owner's and public's use of the site and existing buildings outside of the Contract Limits indicated. Schedule the Work to accommodate Owner occupancy during construction. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Limit conduct of especially noisy exterior work to the hours of [ 8:00 a.m. – 3:00 p.m. ].

D. Limit conduct of especially noisy interior work to the hours of [ 8:00 a.m. – 3:00 p.m. ].

E. Where the Work requires the HVAC system to be nonoperational in areas occupied by the Owner, provide temporary heating or cooling as needed for occupant comfort.

1.9 WORK BY OWNER

A. Items noted as NIC (Not In Contract) will be furnished and installed by the Owner.

B. The Owner will furnish and install the following work:
1. Classroom and miscellaneous equipment and furnishings indicated as NIC.
2. Grading and re-seeding of existing lawn areas damaged by construction operations.
3. Repair and reconfiguration of existing landscape irrigation systems made necessary by the Work.

C. Existing Building Removal:
1. The Owner will coordinate with building manufacturer for removal of existing relocatable buildings L, P. Q, R & S. Contractor shall be responsible for building safe-off and prep work.

**END OF SECTION 01 1100**

**SECTION 01 2100 - CASH ALLOWANCES**

**PART 1 - GENERAL**

1.1 SUMMARY

A. To provide adequate budget and bonding to cover items not precisely determined by the Owner prior to bidding, allow within the proposed Contract Sum the amounts described in this Section.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Other provisions concerning Cash Allowances are stated in Paragraph 3.8 of the General Conditions.
3. Other provisions concerning Cash Allowances also may be stated in other Sections of these Specifications.

1.2 CASH ALLOWANCE PROVISIONS

A. Costs Included in Cash Allowances: As defined in the General and Supplementary Conditions.

B. Architect Responsibilities: Architect shall meet with the Owner, Contractor and product manufacturer to determine the products for use.

C. Contractor Responsibilities: Cooperate with Owner’s testing laboratory to obtain timely information relative to substrate conditions and actual cost of products selected.

D. Differences between the allowance amount and the actual cost of the Work will be adjusted by Change Order.

1.3 ALLOWANCES SCHEDULE

A. Repair of Sprinkler Irrigation System and Landscaping: Include the sum of **$15,000.00** for the replacement of existing or the installation of new sprinkler heads, valves, piping and other equipment and accessories necessary for the proper operation of the existing system where not specifically shown on the drawings for replacement or new installation. Also includes planting of new sod in damaged areas not covered in the project scope.

**END OF SECTION 01 2100**

**SECTION 01 2500 - SUBSTITUTION PROCEDURES**

**PART 1 - GENERAL**

1.1 SUMMARY

A. This Section describes procedures for securing approval of proposed substitutions.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Make submittals in accordance with pertinent provisions of Section 01 3300.

1.2 SUBSTITUTIONS

A. Substitutions: Contractors, subcontractors and/or material suppliers shall comply with the requirements set forth in this Section. All requests for material substitutions shall be submitted with all required substantiating data, comparisons to the material specified, including samples and colors as needed to determine their acceptance. Failure to provide the required documentation is justification for rejection.
1. Prior to Bid: Substitution Requests shall be submitted a minimum of 10 days prior to the bid (if material is to be included on the final addendum). Substitutions may be submitted by general contractor or subcontractor bidders directly to the Architect.
2. After Award of Contract. Substitution Requests may be submitted not more than 35 days after the award of the contract. Substitution requests shall only be submitted by the General Contractor.
**3. Substitution Requests received greater than 35 days after the award shall be rejected.**

B. Required Substitution Submittal Requirements:
1. Submit required substitution information with a completed “Substitution Request Form” found at the end of this Section.
2. Manufacturer's descriptive literature and product specifications for each product, with the proposed products clearly identified.
3. Comparative specification data between the specified item and the proposed substitution, showing compliance with the specified requirements.
4. Test reports indicating compliance with ASTM standards and ICC ES approvals where compliance with such standards is required by the Contract Documents or where compliance is claimed by the Contractor requesting substitution.
5. Samples of actual material and color, where applicable.
6. **Submittal without this information will automatically be rejected.**

C. Approval of Substitutions:
1. Where the phrase "or equal," or "or equal as approved by the Architect," occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this Work by the Architect.
2. The burden of proof as to the equivalency of any material, process, or product shall rest with the Contractor. Any or all of the following will be used by the Architect to determine if a proposed substitution is equivalent to the specified products or materials:
a. Code and legislative compliance.
b. Functional performance and characteristics.
c. Industry standard compliance.
d. Composition of materials.
e. Cost.

f. Aesthetic characteristics.
g. Environmental characteristics.
h. Manufacturer characteristics.
i. Installation characteristics.
j. Maintenance requirements.
k. Warranty characteristics.

3. **Approvals shall be at the sole discretion of the Architect and the decision of the Architect shall be final and binding.**
4. The provisions allowing submission of substitutions shall not in any way authorize an extension of time for performance of the Work.

D. Substitution of any material, system, or product that would normally be reviewed by DSA (Structural Safety, Fire/Life Safety, Access Compliance, or Energy) shall be submitted to and approved by DSA prior to fabrication or use. Such substitutions shall be considered Construction Change Document in accordance with Section 01 2600.

1.3 DELAYS

A. Delays in construction arising by virtue of the non-availability of a specified material due to late approval and/or ordering of materials will not be considered as justifying an extension of the agreed Time of Completion, or reason for change.

B. All additional time required by the Architect or his consultants in dealing with such delay will be charged to the Contractor at the rates described in section 01 7700 1.4.B.2.

C. Equal or better material replacements caused by delay in approvals and/or ordering may cost more than the original material specified. Increased costs shall be absorbed by the Contractor and not the Owner.

**END OF SECTION 01 2500**

MANGINI

**MANGINI ASSOCIATES INC.**
4320 West Mineral King Avenue
Visalia, California 93291
(559) 627-0530

**www.mangini.us**

# SUBSTITUTION REQUEST FORM

**PROJECT:** _____

**SPECFICIATION SECTION:** _____ **ARTICLE/PARAGRAPH:** _____

**SPECIFIED SECTION:** _____

**PROPOSE SUBSTITUTION:** _____

**Attach complete technical data including laboratory tests and code approvals, detailed drawings, and other data indicating compliance with the requirements of the Contract Documents. Clearly identify products being proposed for substitution. Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.**

**FILL IN BLANKS BELOW:**

A. Does the substitution affect dimensions on Drawings? ☐Yes ☐No

B. Will the undersigned pay for changes to the building design, including building design, engineering and detailing costs caused by the requested substitution? **(Negative response may be cause for rejection)**
☐Yes ☐No Explain: _____

C. What affect does substitution have on other trades? _____

D. Differences between proposed substitution and specified item? _____

E. Manufacturer's guarantee of the proposed and specified items are: ☐Same ☐Different
Explain: _____

F. Manufacturer will provide colors that match color selection in finish schedule: ☐Yes ☐No

**The Undersigned hereby certifies that the function, appearance, and quality are equivalent to or superior to the specified item. The undersigned agrees to waive all claims for additional costs related to accepted substitution, including costs associated with changes to building design, engineering, or details, which may subsequently become apparent.**

Submitted by: _____

Signature: _____ Date: _____

Firm: _____

Phone: _____ Address: _____

Fax: _____

**ARCHITECT'S REVIEW AND ACTION**

☐Accepted – Make submittals in accordance with Section 01 2500.
☐Accepted as noted – Make submittals in accordance with Section 01 2500.
☐Rejected – Use specified materials.
☐Received too late – Use specified materials.

**By:** _____ **Date:** _____

**MANGINI ASSOCIATES INC.**

Remarks: _____

## SECTION 01 2600 - CONTRACT MODIFICATION PROCEDURES AND FORMS (DSA)

### PART 1 - GENERAL

1.1 SUMMARY:

A. This section includes procedural requirements for consideration and execution of modifications to and interpretations of the Contract Documents. This section is intended to supplement requirements set forth in the Agreement and the General and Supplementary Conditions.

B. Section includes:
1. Documentation of changes in Contract Sum and Contract Time.
2. Interpretation and clarification procedures.
3. Change procedures.
4. Correlation of Contractor submittals based on changes.

C. Related Sections:
1. Close coordination between this Section, the General and Supplementary Conditions, and Divisions 1 through 33 is required.
2. Section 00 5210: Agreement, Contract Sum, retainage, payment period, values of unit prices.
3. Section 00 7210: Requirements for progress payments, final payment, changes in the Work.
4. Section 00 7310: Percentage allowances for Contractor's overhead and profit.
5. Section 01 2100: Payment procedures relating to allowances.

1.2 DIVISION OF THE STATE ARCHITECT REQUIREMENTS

A. In addition to the modification requirements of this section, the Agreement, and the General and Supplementary Conditions, the Division of the State Architect (DSA) requires that all changes to the approved construction documents that affect structural, accessibility, or fire/life safety portions of the Project be submitted to and approved by DSA in accordance with the procedure set forth in the current edition of DSA Interpretive Regulation IR A-6.

B. Definitions:
1. **Approved Construction Documents:** The approved construction documents are the drawings, specifications, addenda, deferred approvals, changes and bulletins approved by the governing code jurisdiction.
2. **Change:** A change is a revision, modification, deletion, addition, or substitution to the approved Construction Documents.
3. **Change Order:** A document defining and memorializing construction changes that result in changes to the Construction Contract, usually changing Contract Sum or Contract Time.
4. **Clarification:** A clarification is a statement that clarifies (but does not change) the requirements of the approved Construction Documents.
5. **Construction Change Directive:** A document defining and memorializing construction changes that result in changes to the Construction Contract, usually changing Contract Sum or Contract Time, specifically when the Owner and Contractor do not agree to the terms surrounding the changed work.
6. **Construction Change Documents (CCD):** The documentation of construction changes for DSA purposes, using DSA Form-140, prepared and submitted by the Architect.
7. **Contract:** A written agreement for construction, alteration, reconstruction, repair, or other construction activities.
8. **DSA:** The Division of the State Architect (DSA) is the Authority Having Jurisdiction over Project for code compliance.
9. **Interpretation:** An interpretation is a statement that interprets (but does not change) the requirements of the approved Construction Documents.

C. **DSA Changes:** In accordance with the current edition of DSA Interpretation of Regulation IR A-6, changes to the approved construction documents that affect structural, accessibility, or fire/life safety portions of the Project made after a contract for the Work has been let shall be made by means of a Construction Change Document submitted and approved by DSA prior to commencement of the Work shown thereon.

D. **Non-DSA Changes:** In accordance with the current edition of DSA Interpretation of Regulation IR A-6, changes to the approved construction documents that do not affect structural, accessibility, or fire/life safety portions of the Project are not required to be submitted to or approved by DSA.

E. **Change Orders:** DSA does not review change orders.

1.3 MODIFICATION PROCEDURES

A. Definitions:
   1. **Bulletin:** A bulletin is a document produced by the Architect to memorialize all changes, clarifications and interpretations to the approved Construction Documents. A bulletin may or may not change the Contract Sum or the Contract Time.
      a. For the purpose of changes requiring DSA approval, the Architect's Bulletin number will be the same as the DSA CCD number.
   2. **Bulletin Log:** The Bulletin Log is an organized method of numbering, logging, cost accounting, and tracking the status of each bulletin issued.

B. For minor changes not involving an adjustment to the Contract Sum or Contract, the Architect will issue a Bulletin which provides supplementary instructions and information, including a detailed description of the change with supplementary or revised drawings and specifications.
   1. Proceeding with the changes described in the Bulletin indicates the Contractor's acknowledgment that there will be no change in Contract Sum or Contract Time.
   2. In the event the Contractor believes that such Bulletin constitutes a change to the adjustment to the Contract Sum or Contract Time, the Contractor shall immediately give written notice to the Architect within 10 calendar days of receipt of the Bulletin stating that the Contractor considers the Bulletin to be a Change Order. Failure to give such written notice shall waive the Contractor’s right to seek additional time or cost.

C. For changes involving adjustment to the Contract Sum or Contract Time, Architect will issue a Bulletin which provides a detailed description of the proposed change with supplementary or revised drawings and specifications.
   1. Contractor shall prepare and submit a fixed price quotation in the form of a Change Order Request (COR) within 14 calendar days.
   2. The Owner shall provide written acceptance of the Contractor's COR prior to the Contractor commencing work described in the COR.

D. The Contractor may propose a change by submitting a Change Order Request (COR) to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6200.

E. Execution of Change Orders: Architect will issue Change Orders on the form attached at the end of this Section for signatures of parties as provided in the Conditions of the Contract.

F. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

H. Promptly enter changes in Project Record Documents.

1.4 CONTRACT INTERPRETATION AND CLARIFICATION PROCEDURES

A. **Request for Information (RFI):** A written request from the Contractor to the Architect, seeking an interpretation or a clarification of some requirement of the Contract Documents. The Contractor shall clearly and concisely set forth the issue for which it seeks clarification or interpretation and why a response is needed from the Architect. The Contractor shall, in the written request, set forth its interpretation or understanding of the contract's requirements along with reasons why it has reached such an understanding.
   1. The Architect will review all RFI to determine whether they are RFI within the meaning of this term. Project communications; substitution submittals; product data, shop drawings, or samples submittals, or construction schedule submittals shall not transmitted by RFI. Project communications shall not be considered RFI.
   2. Responses to RFI shall be issued within 10 calendar days of receipt of the request from the Contractor unless the Architect determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Architect, the Architect will, within 10 calendar days of receipt of the request, notify the Contractor of the anticipated response time. If the Contractor submits a Request for Information on an activity with 10 calendar days or less of float on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Architect to respond to the request provided that the Architect responds within the 10 calendar days set forth above.
   3. In the event the Contractor believes that a response to a Request for Information will cause a change to the requirements of the Contract Documents, the Contractor shall immediately give written notice to the Architect within 10 calendar days of receipt of the request the Architect stating that the Contractor considers the response to be a Change Order. Failure to give such written notice shall waive the Contractor's right to seek additional time or cost under the Changes article of the General Conditions.
   4. Failure on the part of the Contractor to provide timely Requests for Information does not constitute a crisis solution from the Architect.
   5. Requests for Information that affect structural, accessibility, or fire/life safety portions of the Project made after a contract for the Work has been let shall be submitted to and approved by DSA as a Construction Change Document prior to commencement of the Work shown thereon.

**END OF SECTION 01 2600**

MANGINI

MANGINI ASSOCIATES INC.
4320 West Mineral King Avenue
Visalia, California 93291
(559) 627-0530

www.mangini.us

# REQUEST FOR INFORMATION RFI NO.

**TO:** **Mangini Associates Inc.**
**Attn:**

**DATE:**
**ARCHITECT'S RFI NO.:**
**PROJECT NO.:**
**DSA APPL. NO.:**

**PROJECT:**

**Subject:** _____
**Plan/Spec. Ref:** _____
**Question:** _____
**Suggestion:** _____
**Attachments:** _____
_____

**Contractor's Contract Status:**

- ☐ No change in contract time of sum required
- ☐ Change in contract time may be required
- ☐ Change in contract sum may be required

The undersigned certifies that the Contractor has thoroughly reviewed all Contract Documents and determines that the information requested is not contained in the Contract Documents.

**By:** _____ **Company:** _____ **Title:** _____
**Phone:** _____ **Fax:** _____ **Email:** _____

**Response:**

**By:** _____ **Date:** _____
**MANGINI ASSOCIATES INC.**

**CC:** _____

## SECTION 01 2910 - PAYMENT PROCEDURES

## PART 1 - GENERAL

1.1 SUMMARY

A. Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.

B. Related Sections:
1. Section 00 7210: General Conditions related to payment procedures.
2. Section 01 3210: Construction schedules and schedule updates.

1.2 SCHEDULE OF VALUES

A. One week prior to first application for payment, submit proposed Schedule of Values to Architect.
1. Meet with the Architect and determine additional data, if any, required to be submitted.
2. Secure Architect's approval of Schedule of Values prior to submitting first application for payment.
3. Without documentation, the Architect will value the work and spread the costs throughout the project.

B. Construction Schedule Correlation: Schedule of Values line items shall be identical to construction schedule activity items.

C. Activity Dollar Value: Assign a dollar value to each activity which includes overhead and profit.

D. Construction Activity Breakdown:
1. Limit activities to a single floor level.
2. Separate vertical activities from horizontal activities.
3. Separate site work into quadrants.
4. Separate on-site work from off-site work.
5. For plumbing, mechanical, and electrical work, separate activities into underground, rough-in, and finish activities.
6. Separate costs (cabling, devices, installation, programming, testing) for each of the following systems from the other power and lighting electrical costs:
    a. Fire alarm.
    b. Data
    c. Telephone.
    d. Intercom / clock.
    e. Intrusion alarm.
7. For concrete work, separate activities into footings, exterior walks, interior slabs, curbs/mowstrips.

E. Stored Materials: When the Contractor desires to request payment for stored materials (on-site or off-site), such materials shall be identified in the schedule as a material line item. Materials not identified as material line item will not be considered for payment as stored materials and will only be considered for payment when incorporated into the Work.

F. Division 1 Activities: At a minimum, break down Division 1 costs into the following categories:
1. Mobilization.
2. Surveying.
3. Supervision/administration.
4. Bonds and insurance.
5. Temporary facilities and controls.

6. Demobilization.

G. Cost Correlation: Progress in terms of Contractor's applications for payment shall be measured as a percentage and shall be based on an estimate of actual dollar value of work completed and materials stored, versus total dollar value for each activity included in Schedule of Values, less applicable retainage.

1.3 QUALITY ASSURANCE

A. Assure arithmetical accuracy of the sums described.

B. When so requested by the Architect, provide copies of the subcontracts or other data acceptable to the Architect, substantiating the sums described.

1.4 PAYMENT FOR STORED MATERIALS

A. The Contractor is encouraged to order materials early in order to prevent delays. **Delays arising from non-availability of a specified material due to late approval and/or ordering of materials will not be considered as justifying an extension of time or reason for change. Refer to Section 01 6200.**

B. The Architect and Owner will consider payment for materials stored properly in accordance with the General Conditions. Payment for materials stored off-site will require, at a minimum:
1. Storage at a bonded or insured yard or warehouse with the stored materials properly tagged and identifiable for the project;
2. Insurance certificate acceptable to the Owner naming the Owner as additional insured, with the stored items specifically described on the certificate;
3. Verification by the Inspector of Record;
4. Manufacturer's invoices for materials and freight.

1.5 APPLICATIONS FOR PAYMENT

A. **General:** Use AIA Document G702, "Application for Payment" as summary and certification page.

B . **Initial Application for Payment:** Submittal of the following items is a condition precedent to certification and payment of the first application for payment. The Architect may refuse to certify payment, and the Owner shall have the right to refuse to pay any certified amount, if the Contractor has not completed or submitted any or all of the following:
1. Listing of subcontractors and principal suppliers and fabricators.
2. Schedule of Values approved by the Architect.
3. Construction Schedule reviewed by the Architect.
4. Listing of Contractor's staff assignments and principal consultants.
5. Inspector of Record signature on the AIA G702 document.

C. **Progress Payments:** Submittal of the following items is a condition precedent to certification and payment of each progress application for payment. **The Architect may refuse to certify payment, and the Owner shall have the right to refuse to pay any certified amount, if the Contractor has not completed and submitted any or all of the following:**
1. Updated construction schedule as specified in Section 01 3210.
2. Recovery schedule specified in Section 01 3210 when required.
3. Inspector of Record signature on the AIA G702 document.

D. **Final Application for Payment:** Submittal of the following items is a condition precedent to certification and payment of the final application for payment. **The Architect may refuse to certify payment, and the Owner shall have the right to refuse to pay any certified amount, if the Contractor has not completed and submitted**

**any or all of the following:**

1. Administrative actions and submittals specified in Section 01 7700 as preliminary procedures for Final Acceptance.
2. Inspector of Record signature on the AIA G702 document.

**END OF SECTION 01 2910**

**SECTION 01 3110 - PROJECT MEETINGS**

**PART 1 - GENERAL**

1.1 DESCRIPTION

A. To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Architect will conduct project meetings throughout the construction period. The Contractor's relations with his subcontractors and materials suppliers and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 SUBMITTALS

A. Agenda Items: To the maximum extent practicable, advise the Architect at least 48 hours in advance of project meetings regarding items to be added to the agenda.

B. Minutes: The Architect will compile minutes of each project meeting, and will furnish one copy to the Contractor and to the Owner. Recipients of copies may make and distribute such other copies as they wish.

1.3 QUALITY ASSURANCE

A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.4 MEETING SCHEDULE

A. Except as noted below for Preconstruction Meeting, project meetings will be held weekly.

B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

1.5 MEETING LOCATION

A. The Architect will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

1.6 PRECONSTRUCTION MEETING

A. Preconstruction Meeting will be scheduled to be held within 15 working days after the Owner has issued the Notice to Proceed.
   1. Mandatory attendance by authorized representatives of the Contractor and major subcontractors, including but not limited to:
      a. Earthwork.
      b. Concrete.
      c. Rough carpentry.
      d. Roofing.
      e. Plumbing/mechanical.
      f. Electrical.
      g. Data
   2. The Architect will advise other interested parties, including the Owner, and request their attendance.

B. Minimum Agenda: Data will be distributed and discussed on at least the following items:
   1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Architect.
   2. Channels and procedures for communications.
   3. Construction schedule, including sequence of critical work.
   4. Contract Documents, including distribution of required copies of original Documents and revisions.
   5. Processing of Shop Drawings and other data submitted to the Architect for review.
   6. Processing of Requests for Information, Proposal Requests, Change Orders and Payment Requests.
   7. Rules and regulations governing performance of the Work; and
   8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

1.7 PROJECT MEETINGS

A. Attendance:
   1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
   2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

B. Minimum Agenda:
   1. Review, revise as necessary, and approve minutes of previous meetings.
   2. Review progress of the Work since last meeting, including status of submittals for approval.
   3. Identify problems which impede planned progress.
   4. Develop corrective measures and procedures to regain planned schedule.
   5. Complete other current business.
   6. Verify that Record Drawings are current and accurate.

C. Revisions to Minutes:
   1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
   2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
   3. Challenge to minutes shall be settled as priority portions of "old business" at the next regularly scheduled meeting.

**END OF SECTION 01 3110**

# SECTION 01 3210 - CONSTRUCTION PROGRESS SCHEDULES (Bar Chart)

## PART 1 - GENERAL

1.1 SUMMARY

A. Prepare and maintain construction schedules as specified in this Section.

B. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 00 3110: Preliminary Schedules.
2. Section 01 1110: Work sequences and constraints, Owner occupancy, and Owner furnished items.
3. Section 01 2910: Schedule of values and payments.
4. Section 01 3300: Requirements for shop drawings, product data, and samples.
5. Section 01 7700: Project completion and closeout requirements.

1.2 SUBMITTALS

A. Schedule Development Submittals: Submit 3 color copies of schedule diagram with each submittal.

B. Schedule Updates: Submit 3 color copies of schedule diagram with each with each application for payment.

1.3 SCHEDULE DEVELOPMENT AND UPDATES:

A. Schedule: Submit schedule within 30 calendar days after date of Owner's Notice of Award and prior to first application for payment. Architect may refuse to certify application for payment if a construction schedule has not been submitted.

B. Schedule Updates:
1. Update schedule monthly as part of the application for payment specified in Section 01 2910.
   a. Record actual start and finish dates.
   b. Graphically indicate progress of each active activity and remaining duration.
2. In addition to updates required for applications for payment, provide a complete schedule submittal whenever the Contractor's planned sequence of construction is changed, when approved change orders impact critical path activities, or when time extension is approved by change order.

1.4 RESPONSIBILITY FOR THE SCHEDULE

A. Responsibility for construction planning and the effective and efficient implementation of such to meet the Contract Completion Date and any required milestones are the sole responsibility of the Contractor.

B. Review of the schedule and subsequent revisions by the Owner or the Architect shall be limited to review for compliance with the requirements of the Contract Documents; review shall not imply agreement of the Owner or Architect to the Contractor's planned procedures, coordination, scheduling, etc., as being appropriate or reasonable. Comments offered by the Owner or Architect relating to schedule logic or sequence which are the Contractor's responsibility are offered as a courtesy and are not conditions of acceptance.

C. Non-Waiver:
1. If the accepted schedule and subsequent revisions do not include contractually required constraints, review and/or acceptance of the schedule and subsequent revisions by the Owner or the Architect shall not waive such requirements.

2. Review of the schedule and subsequent revisions by the Owner or the Architect shall not constitute a waiver of any contract requirement.
3. Contract requirements shall take precedence in the event of conflicts between the accepted schedule and contract requirements.

1.5 CONTRACT MODIFICATIONS

A. When a contract modification is required, submit proposed schedule revisions reflecting the proposed change impact.

B. Time Impact Analysis: Time impact analysis shall be provided as support of a time extension request, claim or request for equitable adjustment by the Contractor.
1. Submit a time impact analysis illustrating the influence of each change or delay on the Contract Completion Date or milestones. The current monthly updated schedule accepted by the Architect shall be used to display the impacts of the change. No other non-approved modifications shall be incorporated into the schedule being used to justify the change impact.
2. Each time impact analysis shall include a fragmentary network demonstrating how the Contractor proposes to incorporate the impact into the schedule. The fragmentary network shall identify the predecessors to the new activities and demonstrate the impact to successor activities.
3. Include a narrative report describing the effects of new activities and relationships to interim and Contract Completion Dates.
4. Include written certification signed by the major subcontractors that they have reviewed and accepted proposed schedule revisions.

C. Determination of contract time extension shall be based on the schedule updates in effect for the time period in question, and other factual information. Actual delays found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be cause for time extension to the Contract Completion Date.

1.6 TIME EXTENSIONS

A. Extension of time for performance will be granted only to the extent that a delay occurs which impacts activities currently on the critical path, consumes all available float, and extends completion of the Work beyond the current Contract Completion Date.

B. The Contractor acknowledges and agrees that delays in activities which, according to the schedule, does not in fact actually affect any milestone completion or the Contract Completion Date shown on the schedule at the time of delay, will not be a basis for a time extension.

1.7 SCHEDULE RECOVERY

A. The Contractor shall take action to put the Project back on schedule, at no additional cost to the Owner, when it becomes apparent from the current schedule that, through no fault of the Owner:
1. The critical path becomes more than 5% behind the time remaining for completion of the Work.
2. Any milestone required by the Contract Documents may not be met.
3. Any schedule update reveals that the Work will complete later than the Contract Completion Date.

B. Action by the Contractor to put the Work back on schedule may include any or all of the following:
1. Increase construction manpower;
2. Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing;

3. Reschedule activities to achieve maximum practical concurrency of activities;
4. Expedite delivery of materials.

C. Notify the Architect of the specific measures taken or planned to increase the rate of progress together with an estimate of when scheduled progress will be regained and submit planned revisions to construction schedule prior to implementation of such measures and schedule revisions.

1.8 VOLUNTARY ACCELERATION

A. Early completion or voluntary acceleration of the schedule by the Contractor is acceptable provided that:
1. The Owner is agreeable to such acceleration and so notifies the Contractor in writing;
2. At the time of submission of the Preliminary Construction Schedule, such acceleration is clearly indicated and the Owner is notified of actions on the Owner's part necessary to accommodate the change or acceleration;
3. The Owner is compensated for any inconvenience or expense associated with such acceleration;
4. The time between early completion date and the Contract Completion date is identified as a schedule activity as “Project Float Time.” Such “Project Float Time” within the construction schedule is not for the exclusive use or benefit of either the Owner or the Contractor but is a jointly owned, expiring project resource available to both parties as needed to meet contract milestones and the Contract Completion Date.

B. The Owner may require various changes in the Work. Pursuant to the voluntary acceleration and float sharing provisions of this Section, no time extensions will be granted nor delay damages paid until a delay occurs that impacts activities currently on the critical path, consumes all available float, and extends completion of the Work beyond the current Contract Completion Date.

1.9 PROJECT SCHEDULE

A. Contract Time: As established by the Agreement Between the Owner and Contractor and amended by change order.

B. Progress of the Work:
1. Time is of the essence in the performance of this Contract.
2. Schedule the Work in such a manner as to provide for timely completion.
3. Begin schedule with the Notice to Proceed and conclude with the late-finish date of the critical path on the Contract Completion Date which shall be the date of Notice of Completion.

C. Plan of the Work: The schedule shall reflect Contractor’s actual plan for prosecution of the Work.

D. DSA Oversight Process: In connection with the DSA Construction Oversight Process, which includes the use of inspection cards and review of changes to the DSA-approved construction documents, the Contractor must (a) include specific tasks in its baseline schedule to take into account these procedures since they are critical path issues; and (b) include a reasonable amount of float in the baseline schedule to accommodate the additional time required by these DSA procedures.

E. Detail: Time scale network diagram in calendar days and prepare at level of detail and logic which will schedule as separate activities all salient features of the Work. At a minimum, include:
1. Project mobilization.
2. Schedule preparation and updates.
3. Submittal and shop drawing preparation.
4. Review and DSA approval of deferred approvals.
5. Review of submittals and shop drawings for critical materials and equipment.

6. Procurement, fabrication, delivery, and installation of major equipment and critical materials.
7. Testing and inspection.

8. Significant activities of the work of each trade.
   a. Separate plumbing, mechanical, and electrical into underground, rough-in, and finish activities.
   b. Separate concrete work activities into footings, exterior walks, interior slabs, curbs/mowstrips.
9. Separate the following systems from other power and lighting electrical activities:
   a. Fire alarm system.
   b. Data, telephone, intercom / clock, intrusion alarm, audio visual systems.
10 Power shut-downs.
11. All milestone dates.
12. Testing of concrete floor slabs for moisture and pH.
13. Remediation of concrete floor slabs due to unsatisfactory moisture or pH conditions.
14. Final clean-up.
15. Start-up and testing.
16. Commissioning.
17. Correction list work.
18. Building flush out (100% outside air for 14 days).
19. Demobilization.
20. Closeout documentation.

F. Provide for schedule, logic, and operating constraints of the Work as specified in Section 01 1100.

1.10 BAR CHART SCHEDULE

A. Prepare a bar chart graphically showing the order of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished, as planned by the Contractor. Indicate a separate time bar for each activity.

B. Format:
   1. Sequence of Listings: The Table of Contents of this Project Manual.
   2. Coordination of Listings: Correspond each schedule activity to a line item listed in the Schedule of Values. Refer to Section 01 2910.
   3. Time Scale: Provide a continuous line to identify the first working day of each week.

C. Identify work of each separate stage and other logically grouped activities. In the case of multiple buildings on 1 site, separate the significant elements of the work of each trade for each building as a sub-schedule. Graphically group activities of separate stages and buildings, **do not use a random (or scattered) format.**

1.11 SCHEDULE ACTIVITIES

A. **Schedule Activities:**
   1. 30 day maximum duration.
   2. Limit activities to a single floor level.
   3. Separate vertical activities from horizontal activities.
   4. Separate site work into quadrants.
   5. Separate on-site work from off-site work.

B. **Activity Information:** Indicate the following information for each activity on network diagram:
   1. Activity description.
   2. Activity number corresponding to the CSI section numbers listed in the Table of Contents.
   3. Duration.

4. Start and completion dates.
5. Status indicator (started or complete).

C. Milestone Activities: Indicate date on the diagram for each of the following milestone activities:
   1. Start project: Start schedule no earlier than the contract award date and the project duration shall start on the Notice to Proceed date.
   2. Early completion: If the Contractor's schedule shows completion of the project prior to the Contract Completion Date, the Contractor shall include an activity named "contractor early completion".
   3. End project: Include as the last activity an activity named "end project" finish date equal to the Contract Completion Date.

**END SECTION 01 3210**

**SECTION 01 3300 - SUBMITTAL PROCEDURES**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this Section.
   **1. The section includes requirements for building systems described as Deferred Approval Items on the drawings or in the specifications.**

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Other requirements for submittals may be described in pertinent Sections of these Specifications.
   3. Section 01 3560: High Performance Criteria Summary.

C. Work not Included:
   1. Submittals not required by the Contract Documents will not be reviewed by the Architect.
   2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Architect unless specifically called for within the Contract Documents.

1.2 SUBMITTALS

A. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section.

B. Substitutions shall comply with the procedures for substitutions specified in Section 01 2500.

C. High Performance Criteria: Submit in accordance with Section 01 3560 - High Performance Criteria Summary under Submittals.

1.3 QUALITY ASSURANCE

A. Coordination of Submittals:
   1. Prior to each submittal to the Architect, the **General Contractor shall** carefully review and coordinate all aspects of each item being submitted.
   2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
   3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.

B. Accuracy of Submittals:
   1. By approving and submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria relate thereto, or will so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

2. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's review or approval of Shop Drawings, Product Data, Samples, or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal requesting a substitution and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by the Architect's review thereof.

1.4 USE OF ARCHITECT'S CAD DRAWINGS

A. General:
1. Electronic CAD files of the Contract Drawings may be provided for Contractor's convenience and use in preparing submittals, subject to the requirements of this Section.
2. All requests by subcontractors for CAD drawings shall be transmitted through the Contractor and CAD files released by the Architect shall only be released to the Contractor.

B. Requirements for Release of Architect's Electronic CAD Files:
1. Release of CAD files is subject to Contractor's acceptance of Architect's "Waiver of Liability for Electronic CAD Files", a copy of which is attached at the end of this section.
2. Receipt of executed liability waiver agreement is a condition precedent to releasing architectural CAD files.

C. Requirements for Release of Civil Engineer's Electronic CAD Files:
1. Cost of Civil Engineer's preparation of civil CAD files shall be borne by the Contractor and is in addition to the Contract Sum.
2. Release of civil CAD files is subject to Contractor's acceptance of Civil Engineer's "Waiver of Liability for Electronic CAD Files". Contact the Civil Engineer to obtain the waiver form.
3. Receipt of executed liability waiver agreement is a condition precedent to releasing civil CAD files.

D. The Contractor assumes all liability and risk for use of electronic CAD files. Architectural / engineering drawings are essentially diagrammatic in terms of graphics and are not intended to provide scalable dimensional accuracy. Electronic CAD files are an incomplete representation of the Contract Documents which may not include addendum information or hand drawn additions or modifications. In the event of a conflict between the signed and approved Construction Documents and the electronic CAD files, the signed and approved Construction Documents shall govern.

E. The transfer of CAD files to the Contractor is for the Contractor's convenience only, and does not in any way release the Contractor from the requirement to produce its own shop drawings by the normal method of preparing plans and details by drafting. Delays in the release of CAD files shall not relieve the Contractor of preparing submittals in a timely fashion and such delays shall not provide a basis for claims of delay and damages.

**PART 2 - PRODUCTS**

2.1 TYPES OF SUBMITTALS

A. Shop Drawings:
1. Scale and Measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
2. Types of Prints Required: Submit Shop Drawings in the form of blackline prints of each sheet.
3. Review comments of the Architect will be shown on the sepia transparency when it is returned to the Contractor. The Contractor may make and distribute such copies as are required for his purposes.

B. Manufacturer's Literature:
   1. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show and highlight the portion of the contents being submitted for review.
   2. Submit seven copies of each item.

C. Samples:
   1. Provide Sample or Samples identical to the precise article proposed to be provided. Identify as described under "Identification of Submittals" below.
   2. Provide three samples; one to be retained by the Architect, one to be returned to the Contractor, and one to be retained by the Inspector of Record.

D. Colors and Patterns: Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect for selection.

2.2 ELECTRONIC SUBMITTALS

A. Electronic submittal are acceptable in lieu of hard copies providing the following requirements are met:
   1. Submittal shall be in PDF format, with book marks for table of contents and each tab, and sub-bookmarks for each item.
   2. All text shall be searchable, except text that is part of a graphic.
   3. Submittal shall include all items required by the Contract Documents, except a binder is not required.
   4. Electronic submittals shall be processed through normal channels. Do not submit directly to the Architect's consultants.
   5. Contractor shall provide Owner and Inspector with hard copies of the final Submittal. Coordinate exact number required with the Architect.
   6. One hard copy of any submittal may be required upon the Architect's request for use during review.

B. Electronic submittals which do not comply with the above requirements will be rejected.

**PART 3 - EXECUTION**

3.1 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.
   1. When material is submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
   2. On resubmittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

3.2 GROUPING OF SUBMITTALS

A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
   1. Partial submittals may be rejected as not complying with the provisions of the Contract.
   2. The Contractor may be held liable for delays so occasioned.

3.3 TIMING AND REVIEW OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

B. In scheduling, allow at least 30 calendar days for review by the Architect following the Architect's receipt of the submittal, unless mutually agreed otherwise in writing by the Architect and the Contractor.

C. Resubmittal Costs: The Architect and the Architect's consultants will review the original submittal only as part of their services to the Owner. If the time expended in resubmittal reviews exceeds normal resubmittal review time, the costs of resubmittal reviews by the Architect or the Architect's consultants will be paid to the Architect by the Owner as additional services on an hourly basis.
   1. The Architect will bill the Owner for the additional services required by the Architect and/or the Architect's consultants for such resubmittal reviews, time expended, and reimbursable expenses incurred, and the Owner shall be reimbursed by deducting the same amount from the Contractor's subsequent Application for Payment.

3.4 REQUIRED SUBMITTALS

A. Provide Submittals as required by each Specification Section.

**END OF SECTION 01 3300**

# WAIVER OF LIABILITY FOR ELECTRONIC CAD FILES

Electronic CAD files for ~~[Project Name and Location],~~Modernization at Monroe Elementary School] have been requested by CONTRACTOR. These files are being provided, subject to the following terms and conditions, pursuant to the acceptance and execution of this agreement. For the purposes of this agreement the term ARCHITECT shall mean the Architect and all of its Consultants.

Electronic files provided are compatible with AutoCAD. ARCHITECT makes no representation as to the compatibility of these files with CONTRACTOR'S hardware or software. Due to the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, ARCHITECT has the right to remove all indicia of ownership and or all involvement from electronic display.

Data contained on these electronic files are part of ARCHITECT'S instruments of service which are copyrighted and proprietary in nature and shall not be used by CONTRACTOR or any other entity receiving this data through or from CONTRACTOR for any purpose other than as a convenience in the preparation of shop drawings and field engineering for the referenced project. The CONTRACTOR agrees that the use of digital information provided by the ARCHITECT for any purpose or activity that constitutes the practice of Land Surveying and/or Civil Engineering, as defined by the California Business and Professions Code, will be by or under the direct supervision of a Land Surveyor or Civil Engineer licensed to practice in the State of California. Such practices include, but are not limited to creating a GPS model for earthwork. Any use or reuse by CONTRACTOR or by others will be at CONTRACTOR'S sole risk and without liability or legal exposure to ARCHITECT.

The transfer of electronic files to CONTRACTOR is for the CONTRACTOR'S convenience only, and does not in any way relieve CONTRACTOR from the requirement to produce shop drawings by the normal method of preparing plans and details by drafting. Delays in release of CAD files shall not relieve CONTRACTOR of responsibility for preparing shop drawings or providing field engineering in a timely fashion and such delays shall not provide a basis for claims of delay and damages.

The CONTRACTOR agrees to reciprocate with the ARCHITECT, upon request, relative to drawing files produced by it or its subcontractors for the subject project, under the same conditions as we have received digital files from the ARCHITECT.

The CONTRACTOR assumes all liability and risk for use of architectural / engineering electronic CAD files and agrees these electronic files are not construction documents and that differences may exist between these electronic files and corresponding hard copy construction documents. Electronic CAD files are an incomplete representation of the Contract Documents which may not include addendum information or hand drawn additions or modifications. In the event a conflict arises, signed and sealed hard copy construction documents will govern. By using these electronic files the CONTRACTOR is in no way relieved of its duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate work with that of other CONTRACTORS on the project.

CONTRACTOR recognizes the instability of electronic storage media and that the transfer of electronic data may not be total or accurate, because of equipment and/or software incompatibility, or changes that may be made by CONTRACTOR and/or other entities receiving this data through or from CONTRACTOR during the editing of the information provided.

CONTRACTOR agrees to make no claim, and hereby waives, to the fullest extent permitted by law, any claim or cause of action against ARCHITECT, ARCHITECT'S officers, directors, employees, agents, or consultants that may arise out of or in connection with CONTRACTOR'S use of the electronic files. CONTRACTOR agrees to the fullest extent permitted by law, to indemnify and hold ARCHITECT and OWNER harmless from any damage, liability, or cost, including reasonable attorneys' fees and costs of defense, arising from any reuse or modification of the plans and specifications by CONTRACTOR or any person or entity which acquires or obtains the plans and specifications. In no event shall ARCHITECT or OWNER be liable for any loss of profit or any damages. It is understood that CONTRACTOR shall be solely responsible for verification of conditions and coordination of their work into the work product.

Under no circumstances shall delivery of the electronic files to CONTRACTOR be deemed a sale by ARCHITECT, and ARCHITECT makes no warranties, either express or implied, of merchantability and fitness for any particular purpose.

| | |
|---|---|
| _____ | _____ |
| CONTRACTOR Name | Printed Name and Title |
| _____ | _____ |
| CONTRACTOR Address | Authorized Signature |
| _____ | _____ |
| | Date |

List drawing sheets requested below or attach separate list:

_____

_____

## SECTION 01 4320 - DSA CONSTRUCTION OVERSIGHT

## PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes the oversight provided by the Division of the State Owner (DSA) for projects under its jurisdiction.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 01 2600: Contract modification procedures and forms.
2. Section 01 4520: Testing and inspection services.

1.2 DEFINITIONS

A. The following definitions apply to terms used in this Section:
1. DSA Approved Construction Documents: Portions of plans, specifications, addenda, deferred submittals, revisions, and construction change documents (CCDs) duly approved by DSA that contain information related to, and affecting Structural Safety, Fire/Life Safety, and Accessibility. While all portions of the construction documents may contain a DSA identification stamp, this stamp is not the approval. The DSA approval is indicated by a letter to the District. This letter clarifies that the approval is limited to Structural Safety, Fire/Life Safety and Accessibility.

1.3 DSA PROCEDURES, INTERPRETATION OF REGULATIONS, AND FORMS

A. The requirements of the following DSA procedural documents shall apply to this Section:
1. DSA Procedure PR 13-01: Construction Oversight Process.

B. The requirements of the following DSA Interpretation of Regulations documents shall apply to this Section:
1. DSA IR A-8: Project Inspector and Assistant Inspector Duties and Performance.
2. DSA IR A-13: Stop Work and Order to Comply.

C. The Project Inspector, assistant inspectors, Laboratory of Record, Architect, other design professionals, and the Owner shall communicate project information and make certain reports pertaining to the status of construction compliance using the following DSA forms:
1. DSA 1 Application for Approval of Plans and Specifications
2. DSA 5 Project/Special Inspector Qualification Record
3. DSA 6-AE Architect/Engineer Verified Report
4. DSA 6-C Contractor Verified Report
5. DSA 6-PI Project Inspector Verified Report
6. DSA 102-IC Construction Start Notice/Inspection Card Request
7. DSA 103 Statement of Structural Tests and Special Inspections
8. DSA 130 Certificate of Compliance - Approved Bleacher/Grandstand Fabricator
9. DSA 140 Application for Approval of Construction Change Document.
10. DSA 151 Project Inspector Notifications
11. DSA 152 Project Inspector Card
12. DSA 154 Notice of Deviations/Resolution of Deviations
13. DSA 155 Project Inspector Semi-Monthly Report
14. DSA 156 Commencement/Completion of Work Notification
15. DSA 291 Laboratory of Record Verified Report

16. DSA 292 Special Inspectors Employed Directly by the District Verified Report
17. DSA 293 Geotechnical Verified Report

1.4 QUALITY ASSURANCE

A. Project Inspector: The Owner shall employ a DSA approved Project Inspector in accordance with the requirements of the California Code of Regulations, Title 24. The Inspector's duties are specifically defined in Title 24, Part 1, Section 4-342.
   1. The work of construction in all stages of progress shall be subject to the personal continuous inspection of the Inspector.
   2. The Inspector shall have free access to any or all parts of the work at any time.
   3. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep the Inspector fully informed respecting the progress and manner of the work and character of the materials.
   4. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.

B. DSA Construction Oversight: California Code of Regulations (CCR), Title 24, Part 1, Chapter 4, Article 1 (Sections 4-201 through 4-222) and Group 1, Articles 5 and 6 (Sections 4-330 through 4-344) provide regulations governing the construction process for projects under the jurisdiction of DSA.
   1. Observation of Construction by DSA: The DSA District Engineer conducts occasional site walks to make observations as necessary to ascertain that inspections have been completed diligently. During the site visit, the DSA District Engineer may provide guidance to the Project Inspector, as needed, to ensure enforcement of construction documents.
   2. DSA Field Trip Notes: At the conclusion of the site visit, the DSA Field Engineer issues a Field Trip Note (form DSA 135 or comparable) to the Project Inspector, who shall distribute the field trip note to the school Owner and the responsible design professional.
      a. The field trip note indicates any findings by the Field Engineer that require action by the Project Inspector and/or the Architect and other responsible design professionals to ensure project compliance with Field Act requirements.
      b. The field trip note may include informational comments, including construction status and guidance given to the Project Inspector.
      c. The field trip note becomes a part of the DSA project records.

C. Testing and Special Inspection: Testing required for the project is specified in Section 01 4520 - Testing and Special Inspection Services.
   1. Form DSA-103 is attached to Section 01 4520.
   2. Testing may be required by other Sections that is not specifically noted on Form DSA -103.

1.5 PROJECT INSPECTOR

A. General: The Project Inspector shall perform specific duties in accordance with Title 24, Part 1 (Sections 4-333 and 4-342).
   1. The Project Inspector acts under the direction of the Architect and is subject to supervision by DSA.
   2. The Project Inspector does not have the authority, under Title 24, to direct the Contractor in the execution of the work, nor to stop the work of construction.

B. Code Prescribed Duties:
   1. Maintain Job File: The Inspector shall maintain Project records.
   2. Comprehend of the Construction Documents: The Project Inspector shall study and fully comprehend the requirements of the construction documents in order to provide competent inspection of the work. The Inspector shall:
      a. Consult Architect and other responsible design professionals to resolve uncertainties in the Inspector's comprehension of the plans and specifications prior to construction of that portion of

the work.
   b. Review requirements for each phase of the construction with the Contractor prior to commencing that phase of the work.
   c. Readily identify non-compliant work as the construction progresses to facilitate prompt corrective action.
   d. Verify code-compliant implementation of the materials testing and special inspection program.
   e. Be involved in the Contractor's interpretation of the construction documents in accordance with Title 24, Part 1, Section 4-343.
3. Continuous Inspection of the Work:
   a. Provide complete and timely inspection of every part of the work.
   b. Provide prompt verbal notification to the Contractor of any deviation so that the deviation can be immediately corrected.
   c. The Project Inspector shall have personal knowledge of the construction, obtained through the Project Inspector's own physical inspection of the work in all stages of its progress.
4. Maintain Records of Inspections: The Inspector shall maintain detailed records of all inspections.
5. Communications Required of the Inspector: The Inspector shall during the course of construction, provide specific code-prescribed notices and reports to the Architect, other responsible design professionals, DSA, the Owner, and the Contractor.
6. Inspector's Monitoring of the Materials Testing and Special Inspection Program: The Inspector is responsible, under the direction of the Architect, for monitoring the work of the laboratory of record (LOR) any Special Inspectors hired directly by the Owner to ensure that all materials testing and special inspections required for the project are satisfactorily completed in accordance with the DSA approved documents. The Project Inspector shall monitor the following aspects of the structural testing and special inspection program:
   a. When DSA approval for special inspectors is required for Owner-employed special inspectors, the Project Inspector shall identify and report any special inspectors on the job site that are not DSA approved.
   b. The Project Inspector shall verify that the Laboratory of Record (LOR) is included on the List of DSA Accepted Testing Laboratories on the DSA website.
   c. The Project Inspector shall verify that the LOR and special inspectors have received sufficient advance notification to perform the required material sampling or special inspection.
   d. The Project Inspector is responsible for verifying that all required material sampling and special inspections have been performed. The Project Inspector is also responsible to observe any special Inspector's on-site presence, performance of duties, the special inspector's documentation of complying and non-complying work, and issuance of deviation notices.
   e. The Project Inspector shall report on DSA 155 the status and resolution of deviations reported by any LOR or special inspector.
7. Monitoring of Assistant Inspectors: The Project Inspector shall provide technical guidance to assistant Inspectors and shall verify the assistant inspectors' comprehension of the construction documents.
   a. The Project Inspector shall also monitor the assistant Inspectors' performance, verifying that the assistant inspectors are properly checking the construction, recording inspections, and performing other assigned duties.
   b. The Project Inspector shall ensure that any assistant inspector is performing the duties indicated on the assistant Inspector's approved form DSA 5-AI.
   c. The Project Inspector shall provide continuous on-site supervision of all assistant Inspectors.

C. Prohibited Duties: The Project Inspector is prohibited from performing functions associated with actual construction work such as:
1. Performing construction work.
2. Ordering or purchasing materials.
3. Directing the work of the Contractor, Sub-Contractors, volunteer labor, or any entity performing construction work.
4. Coordinating or scheduling the construction work.

5. Performing "quality control" of construction.
    a. Quality control is the responsibility of the Contractor.
    b. Quality assurance is the responsibility of the Project Inspector.

D. Ancillary Duties: The Project Inspector may perform duties for the Owner that are not code-prescribed as long as such duties do not interfere with inspection duties.
1. It is the Inspector's responsibility to report all ancillary duties to DSA, the Architect, and the structural engineer.
2. The Inspector shall also report unforeseen time demands that are impacting, or will impact, his or her ability to perform code-prescribed duties.
3. DSA may approve a Project Inspector when (in the opinion of DSA) these ancillary duties would not create a conflict of interest. DSA may withhold approval of a Project Inspector or withdraw approval at any time if the appearance of a conflict of interest arises.

1.6 DSA CONSTRUCTION OVERSIGHT PROCESS

A. Project Inspection Card (Form DSA 152): DSA will issue Project Inspection Cards for each project.
1. The number of inspection cards issued varies by project types. In general, one inspection card is required for each separate building and one for the site work, which includes non-building site structures.
2. The project inspection cards are issued electronically by upload to DSA Box.

B. Use of Project Inspection Card:
1. The Project Inspection Card is considered to be an interim verified report by the project inspector.
2. The Project Inspector signs off the applicable blocks and sections on the form as the work progresses. When signing off the blocks and sections of the form, the Project Inspector is verifying that:
    a. Identified areas are determined to be in compliance with the DSA approved construction documents,
    b. Required testing and inspections are complete, and
    c. Required documentation has been received by the Project Inspector.

C. Project Posting of Forms DSA 152: The Project Inspector shall post the forms in his Job File and shall electronically upload the forms to DSA Box.
1. The information in the forms shall always be current. Each time the form is updated, a new electronic posting is required such that the electronically posted form is always kept current.
2. The Project Inspector shall:
    a. Immediately, upon request, make the form available for review by any parties involved in the construction.
    b. Include a current copy of the forms any time a Verified Report (form DSA 6-PI) is submitted.
    c. Upon request, provide a current copy of the forms to DSA, the Owner, or the Architect.

D. Duties of the Inspector of Record: The Inspector shall provide notifications to DSA, Inspector's Semi-monthly Reports, deviation notices, record of communications to the Architect and other responsible design professionals, report the following communications during the course of a construction project which include:
    a. Notifications to DSA: Start of work, minimum 48 hours prior to completion of foundation trenches, minimum 48 hours prior to first concrete placement, and when work is suspended for more than one month.
    b. Semi-monthly Reports: Make semi-monthly reports (on the 1st and 16th of every month) on the progress of construction, on the form DSA 155 and submitted to the Architect and structural engineer, with a copy sent to DSA and the Owner.
    c. Deviation Notices: When the Inspector identifies deviations from the DSA approved plans and specifications, the Inspector shall verbally notify the Contractor. If the deviation is not immediately corrected, the Inspector shall promptly issue a written notice of deviation on form DSA 154 to the Contractor, with a copy sent to the Architect and DSA. The status and resolution of all deviations shall be

documented on semi-monthly reports.

d. Record of Communications to the Architect and other Responsible Design Professionals: All uncertainties in the Inspector's or Contractor's comprehension of the documents shall be reported in writing to the Architect and other responsible design professionals.
e. Reporting for Projects with Work Stoppage: This may be required in cases where DSA issues a Stop Work Order, Order to Comply or a request for Owner to stop work.
f. Verified Reports: Submit verified reports on form DSA 6-PI directly to DSA, with copies to the Architect, other responsible design professionals, and the Owner upon any of the following:
    1) Work on the project is suspended for a period of more than one-month.
    2) The services of the Inspector are terminated for any reason prior to completion of the project and such termination is not a result of work stoppage.
    3) DSA requests a verified report.
    4) At the time of occupancy of any building involved in a project prior to completion of the entire DSA approved scope of work.
    5) The entire project is substantially complete. DSA considers the project to be complete when the construction is sufficiently complete in accordance with the DSA approved construction documents so that the Owner can occupy or utilize the project for its intended use, as determined by the Owner and the Architect.

D. Duties of the Laboratory of Record:
1. Meet with the project inspector, design professionals, and the Contractor as needed to mutually communicate and understand the testing and inspection program, and the methods of communication appropriate for the project.
2. Obtain a copy of the DSA approved construction documents from the Architect prior to the commencement of construction.
3. Obtain a copy of the DSA approved Statement of Structural Tests and Special Inspections (form DSA 103) from the Architect prior to the commencement of construction.
4. Report all project related activities to the project inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and Special Inspectors to ensure the testing and special inspection program is satisfactorily completed.
5. Provide material testing as identified in the DSA approved construction documents.
6. Submit test reports to the project inspector on the day the tests were performed for any tests performed on-site.
7. Submit material test reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the material tests were performed to DSA, the Architect, structural engineer, project inspector and the Owner.
8. Immediately submit reports of material tests not conforming to the requirements of the DSA approved construction documents to DSA, the Architect, structural engineer, project inspector and the Owner.
9. The Engineering Manager shall submit an interim Laboratory of Record Verified Report (form DSA 291) and the Geotechnical Engineer shall submit an interim Geotechnical Verified Report (form DSA 293) to DSA, the project inspector, Owner and the Architect upon any of the following events occurring:
    a. Within 14 days of the completion of the material testing/special inspection program.
    b. Work on the project is suspended for a period of more than one month.
    c. The services of the Laboratory of Record are terminated for any reason prior to completion of the project.
    d. DSA requests a verified report.
    e. The Engineering Manager shall submit an interim verified report (form DSA 291) and the Geotechnical Engineer shall submit form DSA 293 to DSA and a copy to the Project Inspector for each of the applicable sections of the form DSA 152, prior to the Project Inspector signing off that section of the project inspection card, if that section required material testing.

E. Duties of Special Inspectors Employed by the Laboratory of Record:
   1. Meet with the Project Inspector, Architect, and the Contractor as needed to mutually communicate and understand the testing and inspection program, and the methods of communication appropriate for the project.
   2. Report all project related activities to the Project Inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and special inspectors to ensure the testing and special inspection program is satisfactorily completed.
   3. Perform work under the supervision of the Engineering Manager for the Laboratory of Record.
   4. Perform inspections in conformance with the DSA approved construction documents, applicable codes and code reference standards.
   5. Prepare detailed daily inspection reports outlining the work inspected and provide the Project Inspector a copy of the reports on the same day the inspections were performed.
   6. Immediately submit reports of materials or work not conforming to the requirements of the DSA approved construction documents to DSA, the Architect, structural engineer, Project Inspector and the Owner.
   7. Submit daily special inspection reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the special inspections were performed to DSA, the Architect, structural engineer, Project Inspector and the Owner.
   8. The Engineering Manager for the Laboratory of Record shall submit verified report form DSA 291 to DSA, the Project Inspector, the Owner and the Architect.
   9. The reports are required to be submitted upon any of the following events occurring:
      a. Within 14 days of the completion of the special inspection work.
      b. Work on the project is suspended for a period of more than one month.
      c. The services of the special inspector are terminated for any reason prior to completion of the project.
      d. DSA requests a verified report.
      e. The Engineering Manager for the Laboratory of Record shall submit an interim verified report to DSA and a copy to the Project Inspector for each of the applicable sections of the form DSA 152, prior to the signing off that section of the project inspection card, if that section required special inspections.

F. Duties of Special Inspectors Not Employed by the Laboratory of Record:
   1. Meet with the Project Inspector, Laboratory of Record, the design professionals, and the Contractors as needed to mutually communicate and understand the testing and inspection program, and the methods of communication appropriate for the project.
   2. Report all project related activities to the Project Inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and special inspectors to ensure the testing and special inspection program is satisfactorily completed.
   3. Perform work under the direction of the Architect, as defined in Section 4-335(f)1.B of the 2022 California Administrative Code (Title 24, Part 1).
   4. Perform inspections in conformance with the DSA approved construction documents, applicable codes and code reference standards.
   5. Prepare detailed daily inspection reports outlining the work inspected and provide the Project Inspector a copy of the reports on the same day the inspections were performed.
   6. Immediately submit reports of materials or work not conforming to the requirements of the DSA approved construction documents to DSA, the Architect, structural engineer, Project Inspector and the Owner.
   7. Submit daily special inspection reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the special inspections were performed to submitted to DSA, the Architect, structural engineer, Project Inspector and the Owner.
   8. Submit Special Inspection Verified Report forms DSA 292 to DSA, the project inspector, the Owner and the Architect upon any of the following events occurring:
      a. Within 14 days of the completion of the special inspection work.

b. Work on the project is suspended for a period of more than one month.
c. The services of the special inspector are terminated for any reason prior to completion of the project.
d. DSA requests a verified report.
e. Submit an interim Special Inspection Verified Report (form DSA 292) to DSA and a copy to the Project Inspector for each of the applicable sections of the form DSA 152, prior to the Project Inspector signing off that section of the project inspection card, if that section required special inspections.

G. Duties of the Architect:
1. Responsible to the Owner and to DSA to see that the completed work conforms in every material respect to the DSA approved construction documents.
2. Ensure the Project Inspector is approved by DSA for the project by submitting form DSA 5 PI to and obtaining approval from DSA prior to the start of construction, and prior to requesting issuance of form DSA 152.
3. Provide a copy of the DSA approved construction documents to the project inspector and Laboratory of Record prior to the commencement of construction.
4. Provide a copy of the DSA approved Statement of Structural Tests and Special Inspections (form DSA 103) to the Project Inspector and Laboratory of Record prior to the commencement of construction.
5. Provide general direction of the work of the Project Inspector.
6. Issue specific instructions to the testing facility and the special inspectors prior to start of construction.
7. Direct and monitor the work of special inspectors who are not provided by the Laboratory of Record, as defined in Section 4-335(f)1B of the 2022 California Administrative Code (Title 24, Part 1).
8. Notify DSA as to the disposition of materials noted on laboratory testing, and/or special inspection reports as not conforming to the DSA approved construction documents.
9. Respond to DSA Field Trip Notes (form DSA 135 or comparable) as necessary.
10. Provide observation of the construction and maintain such personal contact with the project as is necessary to assure themselves of compliance, in every material respect, with the DSA approved construction documents.
11. Submit Architect Verified Reports (form DSA 6-AE) to DSA and to the Project Inspector upon any of the following events occurring:
    a. The project is substantially complete. DSA considers the project to be complete when the construction is sufficiently complete in accordance with the DSA approved construction documents so that the Owner can occupy or utilize the project.
    b. Work on the project is suspended for a period of more than one month.
    c. The services of the Architect or engineer are terminated for any reason prior to completion of the project.
    d. DSA requests a verified report.
    e. The Architect or engineer shall submit an interim Architect Verified Report (form DSA 6-AE) to DSA and a copy to the Project Inspector for each of the applicable sections of the form DSA 152 prior to the Project Inspector signing off that section of the project inspection card.

H. Duties of the Other Responsible Design Professionals:
1. Responsible to the school board and to DSA to see that the completed work for which they are delegated responsibility conforms in every material respect to the DSA approved construction documents.
2. Provide observation of the construction and maintain such personal contact with the project as is necessary to assure themselves of compliance, in every material respect, with the DSA approved construction documents.
3. Submit an Architect/Engineer Verified Report (form DSA 6-AE) to the Architect, who in turn will submit to DSA and the project inspector, upon any of the following events occurring:
    a. The project is substantially complete. DSA considers the project to be complete when the construction is sufficiently complete in accordance with the DSA approved construction documents so that the Owner can occupy or utilize the project.

b. Work on the project is suspended for a period of more than one month.
c. The services of the Architect or engineer are terminated for any reason prior to completion of the project.
d. DSA requests a verified report.
e. The Architect shall submit to DSA and the Project Inspector an Interim Architect/Engineer Verified Report (form DSA 6-AE), signed by all Architects and engineers having delegated responsibility for each of the sections of the form DSA 152 applicable to the areas of delegated responsibility, prior to the Project Inspector signing that section off on the project inspection card.

I. Duties of Contractor:
1. The Contractor shall carefully study the DSA approved documents and shall plan a schedule of operations well ahead of time.
2. If at any time it is discovered that work is being done which is not in accordance with the DSA approved construction documents, the Contractor shall correct the work immediately.
3. Verify that DSA 152 forms were issued for the project prior to the commencement of construction.
4. Meet with the Architect, the Laboratory of Record and the Project Inspector to mutually communicate and understand the testing and inspection program, and the methods of communication appropriate for the project.
5. Notify the Project Inspector, in writing, of the commencement of construction of each and every aspect of the work at least 48 hours in advance by submitting form DSA 156, or other agreed upon written documents, to the Project Inspector.
6. Notify the Project Inspector of the completion of construction of each and every aspect of the work by submitting form DSA 156 (or other agreed upon written documents) to the Project Inspector.
7. Consider the relationship of the signed off blocks and sections of the form DSA 152 and the commencement of subsequent work.
   a. Until the Project Inspector has signed off applicable blocks and sections of the form DSA 152, the Contractor may be prohibited from proceeding with subsequent construction activities that cover up the unapproved work.
   b. Any subsequent construction activities, that cover up the unapproved work, will be subject to a "Stop Work Order" from DSA or the Owner, and are subject to removal and remediation if found to be in non-compliance with the DSA approved construction documents.
8. Submit the final Contractor Verified Reports (form DSA 6-C) to DSA and the Project Inspector upon any of the following events occurring:
   a. The project is substantially complete. DSA considers the project to be complete when the construction is sufficiently complete in accordance with the DSA approved construction documents so that the Owner can occupy or utilize the project.
   b. Work on the project is suspended for a period of more than one month.
   c. The services of the Contractor are terminated for any reason prior to the completion of the project.
   d. DSA requests a verified report.

J. Duties of the Owner:
1. Provide for competent, adequate and continuous construction inspections and material testing for the project by employing an appropriate DSA certified approved Project Inspector and Laboratory of Record.
2. Contractually provide for and ensure that the design team is fulfilling their code required duty to observe the construction by making periodic visits of reasonable frequency.
3. Ensure that the Project Inspector is approved by DSA for the project by submitting form DSA 5 to and obtaining approval from DSA prior to the start of construction and prior to requesting issuance of project inspection cards (DSA 152 forms).
4. Ensure the Laboratory of Record is LEA approved and employed prior to the start of construction and prior to requesting issuance of project inspection cards (DSA 152 forms).
5. Ensure that the project inspection cards (DSA 152 forms) are issued prior to commencement of construction.
6. Submit Statement of Final Actual Project Cost (form DSA 168) to DSA when the project is substantially

complete.

1.7 CONTRACTOR COOPERATION WITH PROJECT INSPECTOR AND DSA

A. The Inspector and DSA shall have access to the Work at all times and at all locations where the Work or parts of the Work is in progress. The Contractor shall provide facilities for such access to enable the Inspector and DSA to perform their functions properly and safely.

**END OF SECTION 01 4320**

## SECTION 01 4520 - TESTING AND SPECIAL INSPECTION SERVICES

### PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes testing and inspection to be provided by the Owner and cooperation required from the Contractor with the Owner's selected testing agency and others responsible for testing and inspecting the Work. For detailed testing requirements, refer to the quality control requirements of the following sections:

1. Section 01 4320: DSA Construction Oversight.
2. Section 03 3000: Concrete testing and inspection.
3. Section 03 1510: Concrete expansion anchor testing.
4. Section 05 5000: Metal fabrications testing and inspection.
5. Section 06 1100: Rough Carpentry.
6. Section 09 0560: Testing of concrete floor slabs for moisture and pH.

B. Testing may be required per the Specification Sections noted above that is not specifically noted on Form DSA-103, Statement of Structural Tests and Special Inspections.

C. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 01 4320: DSA construction oversight.

D. Work Not Included:
1. Selection of testing laboratory: The Owner will select a prequalified independent testing laboratory.
2. Payment for initial testing: The Owner will pay all services of the DSA approved testing laboratory as further described in Part 2 of this Section.

1.2 SUBMITTALS

A. Test Reports:
1. The testing laboratory will provide test and inspection reports for all testing and inspection required by this Section and the Division of the State Architect in accordance with DSA Procedure 13-1.
2. One copy of all test and inspection reports shall be forwarded by the testing laboratory to DSA, the Owner, the Architect, the Engineer, the Inspector, and the Contractor.
3. Reports shall include all tests made regardless of whether such tests indicate that the material is satisfactory or unsatisfactory.
4. Samples taken but not tested shall also be reported.
5. Reports shall indicate that the material or materials were sampled and tested in accordance with the requirements of Title 24, California Code of Regulations, and the Contract Documents.
6. Reports shall indicate the specified design strength and state definitely whether or not the material or materials tested comply with the requirements.

B. Contractor's Statement of Responsibility: In accordance with CBC Section 1704A.4, Contractor shall submit a statement of responsibility to the Architect, the Owner, and DSA prior to the commencement of work of the main wind or seismic force resisting systems or component. Statement of responsibility shall contain acknowledgment of awareness of the special inspection requirements contained in the statement of special inspections.

C. Verified Reports: The testing laboratory will provide interim and final verified reports in accordance with Section 01 4320 and DSA Procedure PR 13-1.

1.3 QUALITY ASSURANCE

A. The Owner will select an independent testing laboratory to conduct tests. Testing laboratory shall be approved by the Architect, Structural Engineer, and the Division of the State Architect.

B. Selection of material required for testing shall be by the laboratory or the Owner's representative and not by the Contractor.

C. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.

D. Division of the State Architect Testing & Inspection: At a minimum, the testing required for the project is indicated in the Form DSA-103, Statement of Structural Tests and Special Inspections attached at the end of this Section.
   1. Where no testing requirements are described, but the Owner or DSA decides that testing is required, the Owner or DSA may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this Section.
   2. Testing may be required by other Specification Sections that is not specifically noted on Form DSA-103, Statement of Structural Tests and Special Inspections.

1.4 MATERIALS, TESTING, AND INSPECTION STANDARDS

A. Comply with the California Building Code, 2022 Edition.

B. Concrete - Section 03 3000:
   1. Material Standards:
      a. Portland cement: CBC Section 1903A.1, ACI 318, Table 26.4.1.1.1(a).
      b. Fly ash: ACI 318, Table 26.4.1.1.1(a).
      c. Concrete aggregates: CBC Section 1903A.5; ACI 318, Section 26.4.1.2.1(a)(1).
   2. Material Tests:
      a. Reinforcing bar test: CBC Section 1910A.2.
      b. Waiver of reinforcing bar testing: CBC Section 1910A.2.
      c. Concrete strength: ACI 318, Section 26.12.
      d. Drilled expansion / epoxy bolt: CBC Section 1910A.5.
      e. Composite construction cores: CBC Section 1910A.4.
   3. Special Inspections:
      a. Job site inspection: CBC Section 1704A.3, Table 1705A.3.
      b. Batch plant inspection: CBC Section 1705A.3.3.
      c. Waiver of batch plant inspection: CBC Section 1705A.3.3.1.
      d. Post-installed anchors: CBC Table 1705A.3, Type 4, Section 1910A.5.

O. Moisture Control Treatment Testing:
   1. Testing and Inspection: Refer to Section 09 0650.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Promptly process and distribute required copies of test reports and related instructions to assure necessary re-testing and replacement of materials with the least possible delay in progress of the Work.

**PART 2 - PRODUCTS**

2.1 PAYMENT FOR TESTING

A. Initial Testing: The Owner will pay for services requested by the Owner.

B. Retesting: When initial tests indicate non-compliance with the Contract Documents, subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency and the costs thereof will be paid by the Contractor.

2.2 CONTRACTOR'S CONVENIENCE TESTING

A. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

2.3 OWNER'S INSPECTOR

A. The Owner shall employ a DSA approved Inspector in accordance with the requirements of the California Code of Regulations, Title 24. The Inspector's duties are specifically defined in Title 24, Part 1, Section 4-342.
1. Refer to Section 01 4320 - DSA Construction Oversight.

B. The work of construction in all stages of progress shall be subject to the personal continuous inspection of the Inspector. The Inspector shall have free access to any or all parts of the work at any time. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep the Inspector fully informed respecting the progress and manner of the work and character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.

**PART 3 - EXECUTION**

3.1 COOPERATION WITH TESTING LABORATORY

A. Representatives of the Owner and the testing laboratory shall have access to the Work at all times and at all locations where the Work or parts of the Work is in progress. The Contractor shall facilities for such access to enable the laboratory to perform its functions properly and safely.

3.2 TAKING SPECIMENS

A. Test specimens and prisms required for concrete, grout and mortar shall be taken by the testing laboratory and delivered directly to the testing laboratory as required by the California Building Code, 2022 Edition.

B. The testing laboratory shall be responsible for testing the samples.

C. Miscellaneous materials to be tested shall be tagged by the Project Inspector and delivered to the testing laboratory for testing. The testing laboratory shall provide specimen containers for the Project Inspector for the required tests.

3.3 SCHEDULES FOR TESTING

A. Establishing Schedule:
1. The Contractor shall notify the Project Inspector a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents, which must by terms of the Contract be tested, in order that the Inspector may arrange for testing of the material at the source of supply.
2. The Contractor shall provide time within the construction schedule required for the laboratory to perform its tests and to issue each of its findings.
3. Contractor shall coordinate times for testing of materials and/or installations with the testing laboratory

not less than 48 hours prior to the need for testing.

B. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to Schedule: When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back charged to the Contractor and shall not be borne by the Owner.

D. Tests and Inspections Required:
   1. Refer to attached Form DSA 103.
   2. Testing may be required by other Specification Sections that is not specifically noted on Form DSA-103, Statement of Structural Tests and Special Inspections.

3.4 UNTESTED MATERIALS

A. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed any required testing and inspection, or prior to receipt of notice from the Architect that testing and inspection will not be required, shall not be incorporated into the Work.

B. If such non-inspected and non-tested material is incorporated into the project, it shall be removed at the Contractor's expense and no consideration will be given for delays or additional cost caused by this action.

**END OF SECTION 01 4520**

DSA

# 103-22

## LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

☐ Project has a geotechnical report or construction documents require special inspection by a geotechnical engineer.
☑ Project does NOT have and does NOT require a geotechnical report.

| | TYPE | BY |
|---|---|---|
| **S1 \| SOILS - GENERAL** | | |
| ☑ S1a: Site Preparation | See Notes | PI |
| **S2 \| COMPACTION AND FILL** | | |
| ☐ S2a: Fill Materials | Test | LOR* |
| ☐ S2b: Fill Placement | Continuous | LOR* |
| ☐ S2c: Compaction | Test | LOR* |
| **S3 \| DRIVEN DEEP FOUNDATIONS (PILES)** | | |
| ☐ S3a: Materials and Members | Continuous | GE* |
| ☐ S3b: Pile Capacity | Test | LOR* |
| ☐ S3c: Driving Operations | Continuous | GE* |
| ☐ S3d: Pile Installation | Continuous | GE* |
| ☐ S3e: Specialty Piles | * | * |
| **S4 \| CAST-IN-PLACE DEEP FOUNDATIONS (PIERS)** | | |
| ☐ S4a: Drilling Operations | Continuous | PI |
| ☐ S4b: Pier Construction | Continuous | PI |
| ☐ S4c: Bearing Strata | Continuous | GE* |
| **S5 \| RETAINING WALLS** | | |
| ☐ S5a: Backfill Placement | Continuous | GE* |
| ☐ S5b: Soil Reinf. and Drainage | Continuous | GE* |
| ☐ S5c: Segmental Retaining Walls | Continuous | GE* |
| **S6 \| OTHER SOILS** | | |
| ☐ S6a: Soil Improvement Test | Test | GE* |
| ☐ S6b: Soil Improvement Inspection | Continuous | GE* |
| ☐ S6c: Not used. | N/A | N/A |
| ☐ S6d: Not used. | N/A | N/A |
| ☐ S6e: Not used. | N/A | N/A |
| ☐ S6f: Not used. | N/A | N/A |
| ☐ S6g: Not used. | N/A | N/A |
| ☐ S6h: Not used. | N/A | N/A |
| ☐ S6j: Not used. | N/A | N/A |
| ☐ S6k: Not used. | N/A | N/A |
| ☐ S6m: Not used. | N/A | N/A |
| ☐ S6n: Not used. | N/A | N/A |
| ☐ S6p: Not used. | | |
| ☐ S6q: Not used. | | |

* See Appendix for additional information.

| | TYPE | BY |
|---|---|---|
| **C1 \| CAST-IN-PLACE CONCRETE** | | |
| ☑ C1a: Mix Design | Continuous | SI |
| ☑ C1b: Reinforcing Steel | Test | LOR |
| ☑ C1c: Concrete Material | Test | LOR |
| ☑ C1d: Strength Test | Test | LOR |
| ☑ C1e: Batch Plant Inspection | Periodic | SI |
| **C2 \| PRESTRESSED CONCRETE** | | |
| ☐ C2a: Tendons and Anchorage | Test | LOR |
| ☐ C2b: Tendon Placement | Periodic | SI |
| ☐ C2c: Concrete Strength | Periodic | SI |
| ☐ C2d: Stressing Operations | Continuous | SI |
| **C3 \| PRECAST CONCRETE** | | |
| ☐ C3a: General Fabrication | Continuous | SI |
| ☐ C3b: General Erection | Periodic | SI* |
| ☐ C3c: Diaphragm Connections | Continuous | SI |
| ☐ C3d: Diaphragm Tolerances | Periodic | SI |
| **C4 \| SHOTCRETE** | | |
| ☐ C4a: Placement | Continuous | SI |
| ☐ C4b: Shotcrete Material | Test | LOR |
| **C5 \| POST-INSTALLED ANCHORS** | | |
| ☑ C5a: Inspection | See notes | SI* |
| ☑ C5b: Test | Test | LOR |
| **C6 \| OTHER CONCRETE** | | |
| ☐ C6a: Not used. | N/A | N/A |
| ☐ C6b: Not used. | N/A | N/A |
| ☐ C6c: Not used. | N/A | N/A |
| ☐ C6d: Not used. | N/A | N/A |
| ☐ C6e: Not used. | N/A | N/A |
| ☐ C6f: Not used. | N/A | N/A |
| ☐ C6g: Not used. | N/A | N/A |
| ☐ C6h: Not used. | N/A | N/A |
| ☐ C6j: Not used. | N/A | N/A |
| ☐ C6k: Not used. | N/A | N/A |
| ☐ C6m: Not used. | | |
| Not used. | | |

* See Appendix for additional information.

Project Name: **Monroe Elementary**
School District: **Hanford Elementary**

Application No.: **02-123247** Increment:
File No.: **16-14**

# LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

| | TYPE | BY |
|---|---|---|
| **M1 \| STRUCTURAL MASONRY f'm PSI:** | | |
| ☐ M1a: Mill Certificates - Reinf. | Periodic | SI* |
| ☐ M1b: Material Certificates | Test | LOR |
| ☐ M1c: Strength Test | Test | LOR |
| ☐ M1d: Mortar Proportions | Periodic | SI |
| ☐ M1e: Grout Proportions | Periodic | SI |
| ☐ M1f: Batch Plant Inspection | | SI |
| ☐ M1g: Core Tests | Test | LOR |
| ☐ M1h: Prisms | Continuous | SI |
| ☐ M1i: Dowels and Supports | Periodic | SI |
| ☐ M1j: Reinforcement and Members | Periodic | SI |
| ☐ M1k: Reinforcement Placement | Continuous | SI |
| ☐ M1l: Grout Placement | Continsuous | SI |
| ☐ M1m: Unit Layup and Joints | Periodic | SI* |
| ☐ M1n: Cold/Hot Weather Work | Periodic | SI |
| ☐ M1o: Anchors and Embeds | Continuous | SI |
| ☐ M1p: Grout Cavity | Continuous | SI |
| **M2 \| VENEER OR GLASS BLOCK PARTITIONS** | | |
| ☐ M2a: Mortar and Grout | Periodic | SI |
| ☐ M2b: Unit Layup and Joints | Periodic | SI |
| ☐ M2c: Wires and Connector | Periodic | SI |
| ☐ M2d: Anchors and Embeds | Periodic | SI |
| ☐ M2e: Cold/Hot Weather Work | Periodic | SI* |
| ☐ M2f: Adhered Veneer Bond | Test | LOR |
| **M3 \| POST-INSTALLED ANCHORS** | | |
| ☐ M3a: Inspection | Varies* | SI* |
| ☐ M3b: Test | Test | LOR |
| **M4 \| OTHER MASONRY** | | |
| ☐ M4a: Not used. | N/A | N/A |
| ☐ M4b: Not used. | N/A | N/A |
| ☐ M4c: Not used. | N/A | N/A |
| ☐ M4d: Not used. | N/A | N/A |
| ☐ M4e: Not used. | N/A | N/A |
| ☐ M4f: Not used. | N/A | N/A |
| ☐ M4g: Not used. | N/A | N/A |
| ☐ M4h: Not used. | N/A | N/A |
| ☐ M4j: Not used. | N/A | N/A |
| ☐ M4k: Not used. | N/A | N/A |
| ☐ M4m: Not used. | | |
| ☐ M4n: Not used. | | |
| ☐ M4p: Not used. | | |
| * See Appendix for additional information. | | |

| | TYPE | BY |
|---|---|---|
| **S/A1 \| STEEL AND ALUMINUM** | | |
| ☐ S/A1a: Material Identification | Periodic | * |
| ☐ S/A1b: Unidentified Material | Test | LOR |
| ☐ S/A1c: Steel Fabrication | Periodic | SI |
| ☐ S/A1d: Buckling Restrained Brace | Test* | LOR |
| **S/A2 \| HIGH-STRENGTH BOLTS** | | |
| ☐ S/A2a: Product Verification | Periodic | SI |
| ☐ S/A2b: Bolts, Nuts, and Washers | Test | LOR |
| ☐ S/A2c: Snug Tight | Periodic | SI |
| ☐ S/A2d: Pretensioned / Slip-Critical | * | SI |
| **S/A3 \| WELDING** | | |
| ☑ S/A3a: Weld Material | Periodic | SI |
| ☑ S/A3b: Certificate of Compliance | Periodic | SI |
| ☑ S/A3c: WPS and Qualifications | Periodic | SI |
| **S/A4 \| SHOP WELDING** | | |
| ☐ S/A4a: Weld Category A | Continuous | SI |
| ☐ S/A4b: Weld Category B | Periodic | SI |
| ☐ S/A4c: Stairs and Railing | Periodic | SI |
| ☐ S/A4d: Reinf. Steel Weldability | Periodic | SI |
| ☐ S/A4e: Reinforcing Steel | Continuous | SI |
| **S/A5 \| FIELD WELDING** | | |
| ☐ S/A5a: Weld Category A | Continuous | SI |
| ☐ S/A5b: Weld Category B | Periodic | SI |
| ☑ S/A5c: End Welded Studs | Periodic | SI |
| ☐ S/A5d: Deck Welds | Periodic | SI |
| ☐ S/A5e: Cold-Formed Steel | Periodic | SI |
| ☐ S/A5f: Stairs and Railing | Periodic | SI |
| ☐ S/A5g: Reinf. Steel Weldability | Periodic | SI |
| ☐ S/A5h: Reinforcing Steel | Continuous | SI |
| **S/A6 \| NONDESTRUCTIVE TESTING** | | |
| ☐ S/A6a: Ultrasonic | Test | LOR |
| ☐ S/A6b: Magnetic Particle | Test | LOR |
| ☐ S/A6c:Not used. | N/A | N/A |
| ☐ S/A6d:Not used. | N/A | N/A |
| ☐ S/A6e:Not used. | N/A | N/A |
| **S/A7 \| STEEL JOISTS AND TRUSSES** | | |
| ☐ S/A7a: Fabrication | Continuous | SI |
| **S/A8 \| SPRAYED FIRE-RESISTANT MATERIALS** | | |
| ☐ S/A8a: Surface and Installation | Periodic | SI |
| ☐ S/A8b: Density | Test | LOR |
| ☐ S/A8c: Bond: Adhesion/Cohesion | Test | LOR |
| * See Appendix for additional information. | | |

Project Name: **Monroe Elementary** Application No.: **02-123247** Increment:
School District: **Hanford Elementary** File No.: **16-14**

# LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

| | TYPE | BY |
|---|---|---|
| **S/A9 \| ANCHOR BOLTS AND ANCHOR RODS** | | |
| ☐ S/A9a: Anchor Rods and Bolts | Test | LOR |
| ☐ S/A9b: Other Threaded Rods | Test | LOR |
| **S/A10 \| STORAGE RACK SYSTEMS** | | |
| ☐ S/A10a: Material Verification | Periodic | SI |
| ☐ S/A10b: Fabrication | Periodic | SI |
| ☐ S/A10c: Anchorage | Periodic | SI |
| ☐ S/A10d: Completed System | Periodic | SI* |
| **S/A11 \| OTHER STEEL AND ALUMINUM** | | |
| ☐ S/A11a: Not used. | N/A | N/A |
| ☐ S/A11b: Not used. | N/A | N/A |
| ☐ S/A11c: Not used. | N/A | N/A |
| ☐ S/A11d: Not used. | N/A | N/A |
| ☐ S/A11e: Not used. | N/A | N/A |
| ☐ S/A11f: Not used. | N/A | N/A |
| ☐ S/A11g: Not used. | N/A | N/A |
| ☐ S/A11h: Not used. | N/A | N/A |
| ☐ S/A11j: Not used. | N/A | N/A |
| ☐ S/A11k: Not used. | N/A | N/A |
| **W1 \| PREFABRICATED WOOD TRUSSES** | | |
| ☐ W1a: Open Web Truss Fabrication | Continuous | SI |
| ☐ W1b: Metal Plate Truss Fabrication | Continuous | SI |
| **W2 \| MANUFACTURED WOOD ELEMENTS** | | |
| ☐ W2a: GL Timber Fabrication | Continuous | SI |
| ☐ W2b: CLT Fabrication | Continuous | SI |
| ☐ W2c: Mass Timber Erection | Periodic | SI |
| ☐ W2d: Connections Type A | Periodic | SI |
| ☐ W2e: Connections Type B | Continuous | SI |
| ☐ W2f: Sealants | Periodic | SI |
| **W3 \| OTHER WOOD** | | |
| ☐ W3a: Not used. | N/A | N/A |
| ☐ W3b: Not used. | N/A | N/A |
| ☐ W3c: Not used. | N/A | N/A |
| ☐ W3d: Not used. | N/A | N/A |
| ☐ W3e: Not used. | N/A | N/A |
| ☐ W3f: Not used. | N/A | N/A |
| ☐ W3g: Not used. | N/A | N/A |
| ☐ W3h: Not used. | N/A | N/A |

* See Appendix for additional information.

| | TYPE | BY |
|---|---|---|
| **X \| OTHER** | | |
| ☐ X01: Product Load Test* | Test | LOR |
| ☐ X02: Non-HSB Installation Torque | Continuous | SI* |
| ☐ X03: Not used. | N/A | N/A |
| ☐ X04: Not used. | N/A | N/A |
| ☐ X05: Not used. | N/A | N/A |
| ☐ X06: Not used. | N/A | N/A |
| ☐ X07: Not used. | N/A | N/A |
| ☐ X08: Not used. | N/A | N/A |
| ☐ X09: Not used. | N/A | N/A |
| ☐ X10: Not used. | N/A | N/A |

**EXEMPTIONS**

Those items identified on the DSA-approved construction documents with a note indicating they are not part of the DSA approval or those items checked below are exempt from test and special inspection requirements. The project inspector shall verify all construction complies with the approved construction documents.

- ☐ Soils: Eligible shallow foundation elements**.
- ☐ Soils: Eligible deep foundation elements - type 1**.
- ☐ Soils: Eligible deep foundation elements - type 2**.
- ☐ Concrete/Masonry: Eligible post-installed anchors**.
- ☑ Concrete: Batch plant inspection for items listed in and complying with CBC Section 1705A.3.3.2.
- ☑ Concrete: Epoxy shear dowels in nonstructural slab-on-grade per CBC Section 1910A.5.4, Exception #4.
- ☑ Concrete/Masonry: Reinforcing bar testing for items listed in and complying with CBC Section 1910A.2.
- ☐ Masonry: Freestanding site walls and retaining walls per DSA IR 21-1.
- ☐ Concrete: Eligible precast elements**.
- ☐ Welding: Eligible fences and gates**.
- ☑ Welding: Eligible railing and ramps**.
- ☐ Welding: Eligible interior cold-formed steel framing**.
- ☐ Welding: Eligible equipment curbs**.
- ☐ Welding: Eligible components supporting MEP distribution systems**.
- ☐ Welding: Eligible mounts and recreational equipment**.
- ☐ Welding: Eligible nonstructural components**.

** See Appendix for eligibility requirements.

Project Name: **Monroe Elementary** Application No.: **02-123247** Increment:
School District: **Hanford Elementary** File No.: **16-14**

# LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

**IMPORTANT:** This form is only a summary list of structural tests and some of the special inspections required for the project. Any items indicated on the approved construction documents with a note stating that the items are not part of the DSA approval are not considered in this form. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of nonstructural components, etc., per Title 24, Part 2, Chapter 17A.

**Legend to TYPE and BY Columns:**

**Continuous** - Indicates continuous special inspection is required.

**Periodic** - Indicates periodic special inspection is required.

**Test** - Indicates a test is required.

**GE** – Indicates special inspection shall be performed by a registered geotechnical engineer or his/her authorized representative, usually associated with the Laboratory of Record.

**LOR** – Indicates test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program (i.e., the Laboratory of Record for the project). See CAC Section 4-335.

**PI** - Indicates special inspection may be performed by a project inspector when specifically approved by DSA.

**SI** - Indicates special inspection shall be performed by an appropriately qualified/approved special inspector.

**Required Verified Reports:**

1. Structural Testing and Inspection: Form DSA 291
2. Concrete Batch Plant Inspection: Form DSA 291
3. Post-installed Anchors: Form DSA 291 or DSA 292
4. Field Welding Inspection: Form DSA 291 or Form DSA 292

Verified reports are required on the following DSA forms:

DSA 291: Laboratory of Record Verified Report

DSA 292: Special Inspectors Employed Directly by the District Verified Report

DSA 293: Geotechnical Verified Report

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

**Name of Architect or Engineer in General Responsible Charge:**

J. Ryan Morrelli

**Name of Structural Engineer of Record (when applicable):**

John Atilano

**Signature of Architect or Structural Engineer:**

**Date:** 7-14-25

**DSA STAMP**

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-123247 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 11/04/2025

Project Name: **Monroe Elementary**
School District: **Hanford Elementary**

Application No.: **02-123247** Increment:
File No.: **16-14**

# Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

**NOTE:** Undefined sections and table references found in this appendix are from the CBC, or California Building Code

| **S1. GENERAL:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S1a: Site Preparation** \| Verify that:<br>• Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations.<br>• Foundation excavations are extended to proper depth and have reached proper material.<br>• Materials below footings are adequate to achieve the design bearing capacity. | Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report. |

| **S2. SOIL COMPACTION AND FILL:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S2a: Fill Materials** \| Perform classification and testing of fill materials. | * Under the supervision of the geotechnical engineer. |
| **S2b: Fill Placement** \| Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill. | * Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the end of this form listing exemptions for limitations. |
| **S2c: Compaction** \| Compaction testing. | Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report. |

| **S3. DRIVEN DEEP FOUNDATIONS (PILES):** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S3a: Materials and Members** \| Verify pile materials, sizes and lengths comply with the requirements. | * By geotechnical engineer or his or her qualified representative. |
| **S3b: Pile Capacity** \| Determine capacities of test piles and conduct additional load tests as required. | * Under the supervision of the geotechnical engineer. |
| **S3c: Driving Operations** \| Inspect driving operations and maintain complete and accurate records for each pile. | * By geotechnical engineer or his or her qualified representative. |

| | |
|---|---|
| **S3d: Pile Installation** \| Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage. | * By geotechnical engineer or his or her qualified representative. |
| **S3e: Specialty Piles** \| For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge. | * As defined on drawings or specifications. |

| **S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):** | |
|---|---|
| **Test or Special Inspection** | **Code References and Note** |
| **S4a: Drilling Operations** \| Inspect drilling operations and maintain complete and accurate records for each pier. | Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix (end of this form) listing exemptions for limitations. |
| **S4b: Pier Construction** \| Verify pier locations, diameters, plumbness, bell diameters (if applicable), lengths and embedment into bedrock (if applicable); record concrete or grout volumes. | Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix (end of this form) listing exemptions for limitations. |
| **S4c: Bearing Strata** \| Confirm adequate end strata bearing capacity. | Provide tests and inspections per CONCRETE section below. |

| **S5. RETAINING WALLS:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S5a: Backfill Placement** \| Placement, compaction and inspection of backfill. | 1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above). |
| **S5b: Soil Reinf. and Drainage** \| Placement of soil reinforcement and/or drainage devices. | * By geotechnical engineer or his or her qualified representative. |
| **S5c: Segmental Retaining Walls** \| Segmental retaining walls; inspect placement of units, dowels, connectors, etc. | * By geotechnical engineer or his or her qualified representative. See DSA IR 18-2. |

| **S6 \| OTHER SOILS** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S6a** \| Soil Improvements | Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance.<br>* By geotechnical engineer or his or her qualified representative. |
| **S6b** \| Inspection of Soil Improvements | * By geotechnical engineer or his or her qualified representative. |
| **S6c.** \| Not used. | N/A |
| **S6d.** \| Not used. | N/A |
| **S6e.** \| Not used. | N/A |
| **S6f.** \| Not used. | N/A |
| **S6g.** \| Not used. | N/A |
| **S6h.** \| Not used. | N/A |
| **S6j.** \| Not used. | N/A |
| **S6k.** \| Not used. | N/A |
| **S6m.** \| Not used. | N/A |
| **S6n.** \| Not used. | N/A |

## Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

| C1. CAST-IN-PLACE CONCRETE | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **C1a: Mix Design** \| Verify use of required design mix. | **Table 1705A.3 Item 5, 1903A.5, 1903A.7, 1904A.1, 1904A.2, 1910A.1 ; ACI 318 Ch. 19, 26.4, 26.13.3.2.** |
| **C1b: Reinforcing Steel** \| Identify, sample, and test reinforcing steel. | **Table 1705A.3 Item 1, 1705A.3.9, 1908A.1, 1910A.2; ACI 318 Ch. 20 and Sections 25.2, 25.3, 25.5.1, 26.6.1; DSA IR 17-10 and BU 24-02. (See Appendix (end of this form) for exemptions.)** |
| **C1c: Concrete Material** \| During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. | **Table 1705A.3 Item 6, 1705A.3.9, 1905A.1.17; ASTM C31, ASTM C172; ACI 318 Sections 26.4, 26.5 & 26.12.** |
| **C1d: Strength Test** \| Test concrete (f'c). | **1905A.1.17; ACI 318 Section 26.12.** |
| **C1e: Batch Plant Inspection** \| Batch plant inspection: Continuous | **Default of "Continuous" per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to "Periodic" subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)** |

| C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1): | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **C2a: Tendons and Anchorage** \| Sample and test prestressing tendons and anchorages. | **1705A.3.4 Table 1705A.3 Item 1, 1910A.3; ACI 318 Ch. 20 and Sections 25.2, 26.6.1.** |
| **C2b: Tendon Placement** \| Inspect placement of prestressing tendons. | **1705A.3.4, Table 1705A.3 Items 1 & 9; ACI 318 Ch. 20 and Sections 25.2, 26.6.1-26.6.3.** |
| **C2c: Concrete Strength** \| Verify in-situ concrete strength prior to stressing of post-tensioning tendons. | **Table 1705A.3 Item 13; ACI 318 Sections 26.10.2, 26.11.2, 26.13.3.3. Special inspector to verify specified concrete strength test prior to stressing.** |
| **C2d: Stressing Operations** \| Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons. | **1705A.3.4, Table 1705A.3 Item 9; ACI 318 Sections 26.10.2, 26.13.1, 26.13.3.2.** |

| C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1): | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **C3a: General Fabrication** \| 1. Inspect fabrication of precast concrete members. *<br>2. Inspect reinforcement of the following precast concrete elements or system(s):<br>a. special moment frames.<br>b. boundary elements of special structural walls.<br>c. coupling beams. | **1705A.3 Item 1, 7.** See Appendix for exemptions. *May be periodic where fabrication occurs in a PCI-certified plant. For underground structures, NPCA plant certification is acceptable. PCI MNL-116-21; PCI MNL-117-13; NPCA Quality Control Manual (QCM) 17th Edition. See IR A-15. |

| | |
|---|---|
| **C3b: General Erection** \| Inspect erection of precast concrete members. | **Table 1705A.3 Item 10**. |
| **C3c: Diaphragm Connections** \| For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for:<br><br>1. Installation of the embedded parts.<br>2. Completion of the continuity of reinforcement across joints.<br>3. Completion of connections in the field. | **Table 1705A.3 Item 11**. |
| **C3d: Diaphragm Tolerances** \| Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5. | **Table 1705A.3 Item 12** |

| **C4. SHOTCRETE (IN ADDITION TO SECTION C1):** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **C4a: Placement** \| Inspect shotcrete placement for proper application techniques. | **1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2 Section 3.4, and ACI 506R.** |
| **C4b: Shotcrete Material** \| Sample and test shotcrete ($f'_c$). | **1908A.2 and 1705A.3.9.** |

| **C5. POST-INSTALLED ANCHORS:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **C5a: Inspection** \| Inspect installation of post-installed anchors | **1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8** (See Appendix (end of this form) for exemptions). ACI 318 Sections 26.7.2, 26.13.1, 26.13.3.2, 26.13.3.3. * May be performed by the project inspector when specifically approved by DSA. |
| **C5b: Test** \| Test post-installed anchors. | **1910A.5.** (See Appendix (end of this form) for exemptions.) |

| **C6. OTHER CONCRETE:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **C6a.** \| Not used. | N/A |
| **C6b.** \| Not used. | N/A |
| **C6c**. \| Not used. | N/A |
| **C6d**. \| Not used. | N/A |
| **C6e**. \| Not used. | N/A |
| **C6f**. \| Not used. | N/A |
| **C6g**. \| Not used. | N/A |
| **C6h**. \| Not used. | N/A |
| **C6**j. \| Not used. | N/A |
| **C6k**. \| Not used. | N/A |
| **C6m**. \| Not used. | Not used. |
| **C6n**. \| Not used. | Not used. |

## Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

| **M1. STRUCTURAL MASONRY:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **M1a: Mill Certificates - Reinf.** \| Mill certificate indicates compliance with requirements for reinforcement, anchors, ties, fasteners and metal accessories. See item C1(b) for identification, sampling and testing of reinforcing steel. | **2103A.4**; TMS 602-16 Article 1.5B.2 & 2.4. * To be performed by qualified LOR representative. Applicable testing by LOR. See IR 17-10 for unidentified reinforcing steel. |
| **M1b: Material Certificates** \| Producer's certificate of compliance for masonry units, mortar and grout materials. | **1705A.4, 2103A.2, 2103A.3, 2103A.5;** TMS 602 Articles 1.5B.2, 2.1, 2.2, 2.6A and 2.6B, and Table 6 footnote 3. |
| **M1c: Strength Test** \| Test masonry (f'm). | **1705A.4. For Unit Strength: 2105A.3**; TMS 602 Articles 1.4B.2 ,1.5B.1 & 1.5B.2. **For Prism (required when $f'_m$ > 2000 psi):2105A.2;** TMS 602 Articles 1.4B.3, 1.4B.4, 1.5B.1 & 1.5B.2. |
| **M1d: Mortar Proportions** \| Verify proportions or properties of site-prepared, premixed or preblended mortar. | TMS 602, Table 3 (row 5), Table 4 Item 1a. DSA PR 20-01. (See Appendix (end of this form) for exemptions.) |
| **M1e: Grout Proportions** \| Verify proportions or properties of site-prepared, premixed or preblended grout. | TMS 602, Table 3 (row 5), Table 4 Item 2d. (See Appendix (end of this form) for exemptions.) |
| **M1f: Batch Plant Inspection** \| Batch plant inspection: Periodic | Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or not required per **1705A.3.3.2.** See IR 17-13. Refer to TMS 602 Table 3 and Table 4, Item #3a. (See Appendix (end of this form) for exemptions.) |
| **M1g: Core Tests** \| Test core-drilled samples. | **2105A.4**. (See Appendix (end of this form) for exemptions.) |
| **M1h: Prisms** \| Inspect preparation of prisms. | TMS 602 Articles 1.4.B.3 & 1.4.B.4 & Table 4 Item 4. |
| **M1i: Dowels and Supports** \| Verify size, location and condition of all dowels, construction supporting masonry, etc. | |
| **M1j: Reinforcement and Members** \| Verify size, grade and type of reinforcement, connectors, and anchor bolts. Verify size and location of structural members. | TMS 602 Table 4, Items 1c & 3c. |
| **M1k: Reinforcement Placement** \| Inspect placement of reinforcement, anchor bolts, and connectors. | TMS 602 Table 4 Item 2c. |
| **M1l: Grout Placement** \| Placement, consolidation, and reconsolidation of grout. | TMS 602 Table 4 Item 3h. |
| **M1m: Unit Layup and Joints** \| Inspect placement of masonry units and construction of mortar joints. | TMS 602 Table 4 Item 3b. |
| **M1n: Cold/Hot Weather Work** \| Verify preparation, construction and protection of masonry during cold weather (temperature below 40º F) or hot weather (temperature above 90º F). | TMS 602 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA. |
| **M1o: Anchors and Embeds** \| Inspect type, size and location of anchors and all other items to be embedded in masonry including other details of anchorage of masonry | TMS 602 Table 4 Item 3d. |

| | |
|---|---|
| to structural members, frames and other construction. | |
| **M1p: Grout Cavity** \| Inspect grout space, including mortar protrusions, prior to placement of grout. | TMS 602 Table 4 Item 2a. |

| **M2. VENEER OR GLASS BLOCK PARTITIONS:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **M2a: Mortar and Grout** \| Verify proportions of site prepared mortar and grout and/or verify certification of premixed mortar. | TMS 602 Table 3 (row 5) and Table 4 Items 1a & 2d. |
| **M2b: Unit Layup and Joints** \| Inspect placement of units and construction of mortar joints. | TMS 602 Table 4 Item 3b. |
| **M2c: Wires and Connector** \| Inspect placement of wire, connectors and anchors | TMS 602 Table 4 Item 2c. |
| **M2d: Anchors and Embeds** \| Inspect type, size and location of anchors and all other items to be embedded in masonry veneer including details of anchorage of masonry to veneer backing, frames and other construction. | TMS 602 Table 4 Item 3d. |
| **M2e: Cold/Hot Weather Work** \| Verify preparation, construction and protection of masonry during cold weather (temperature below 40º F) or hot weather (above 90º F). | TMS 602 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA. |
| **M2f: Adhered Veneer Bond** \| Test adhered veneer bond strength. | **1410.2.1;** TMS 402 Article 12.3.2.4. **(Field-constructed mock-up using specified unit, mortar, and substrate, laboratory tested in accordance with ASTM C1823).** |

| **M3. POST-INSTALLED ANCHORS IN MASONRY:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **M3a: Inspection** \| Inspect installation of post-installed anchors | **1617A.1.19, 1705A.4, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic);** ACI 318 Section 26.13. * May be performed by the project inspector when specifically approved by DSA. (See Appendix (end of this form) for exemptions.) |
| **M3b: Test** \| Test post-installed anchors. | **1705A.4, 1910A.5.** (See Appendix (end of this form) for exemptions.) |

| **M4. OTHER MASONRY:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **M4a.** \| Not used. | N/A |
| **M4b.** \| Not used. | N/A |
| **M4c.** \| Not used. | N/A |
| **M4d.** \| Not used. | N/A |
| **M4e.** \| Not used. | N/A |
| **M4f.** \| Not used. | N/A |
| **M4g.** \| Not used. | N/A |
| **M4h.** \| Not used. | N/A |
| **M4j.** \| Not used. | N/A |
| **M4k.** \| Not used. | N/A |
| **M4m.** \| Not used. | Not used. |
| **M4n.** \| Not used. | Not used. |

# Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

| S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A1a: Material Identification** \| Verify identification of all materials and:<br>• Mill certificates indicate material properties that comply with requirements.<br>• Material sizes, types and grades comply with requirements. | **Table 1705A.2.1 Item 3a–3c.** 2202A.1**;** AISI S100 Section A3.1 & A3.2, AISI S240 Section A3 & A5, AISI S220 Sections A4 & A6. *By special inspector or qualified technician when performed off-site. |
| **S/A1b: Unidentified Material** \| Test unidentified materials | **2202A.1.** |
| **S/A1c: Steel Fabrication** \| Verify and document steel fabrication per DSA- approved construction documents. | Not applicable to cold-formed steel light-frame construction, except for trusses (**1705A.2.4**). |
| **S/A1d: Buckling Restrained Brace** \| Verify and document steel fabrication per DSA-approved construction documents. | Testing and special inspections in accordance with IR 22-4. For DSA accepted fabrication shops, BRB manufacturer's Certificate of Compliance in lieu of testing and special inspections. See IR 22-4. |

| S/A2. HIGH-STRENGTH BOLTS: | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A2a: Product Verification** \| Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents. | **Table 1705A.2.1 Items 1a & 1b, 2202A.1;** AISC 360 Section A3.3, J3.1, and N3.2; RCSC Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9. |
| **S/A2b: Bolts, Nuts, and Washers** \| Test high-strength bolts, nuts and washers. | **Table 1705A.2.1 Item 1c, 2213A.1**; RCSC Section 7.2; DSA IR 17-8. |
| **S/A2c: Snug Tight** \| Bearing-type ("snug tight") connections. | **Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2**; AISC 360 J3.1, J3.2, M2.5 & N5.6; RCSC Section 9.1; DSA IR 17-9. |
| **S/A2d: Pretensioned / Slip-Critical** \| Pretensioned and slip-critical connections. | **Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2;** AISC 360 J3.1, J3.2, M2.5 & N5.6; RCSC Sections 9.2 & 9.3; DSA IR 17-9<br>*"Continuous" or "Periodic" depends on the tightening method used. |

| S/A3. WELDING: | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A3a: Weld Material** \| Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS. | **1705A.2.5, Table 1705A.2.1 Items 4 & 5**; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3. |
| **S/A3b: Certificate of Compliance** \| Verify weld filler material manufacturer's certificate of compliance. | DSA IR 17-3. |
| **S/A3c: WPS and Qualifications** \| Verify WPS, welder qualifications and equipment. | DSA IR 17-3. |

| **S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A4a: Weld Category A** \| Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds. | **Table 1705A.2.1 Items 5a.1–4;** AISC 360 (and AISC 341 as applicable); DSA IR 17-3. |
| **S/A4b: Weld Category** B \| Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds. | **1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360 (and AISC 341 as applicable); DSA IR 17-3. |
| **S/A4c: Stairs and Railing** \| Inspect welding of stairs and railing systems. | **1705A.2.1**; AISC 360 (and AISC 341 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. |
| **S/A4d: Reinf. Steel Weldability** \| Verification of reinforcing steel weldability other than ASTM A706. | **1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates. |
| **S/A4e: Reinforcing Steel** \| Inspect welding of reinforcing steel. | **Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3. |

| **S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A5a: Weld Category A** \| Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds. | **Table 1705A.2.1 Items 5a.1–4;** AISC 360 (AISC 341 as applicable); DSA IR 17-3. |
| **S/A5b: Weld Category B** \| Inspect single-pass fillet welds ≤ 5/16". | **Table 1705A.2.1 Item 5a.5;** AISC 360 (AISC 341 as applicable); DSA IR 17-3. |
| **S/A5c: End Welded Studs** \| Inspect end-welded studs (ASTM A-108) installation (including bend test). | **2213A.2**; AISC 360 (AISC 341 as applicable); AWS D1.1; DSA IR 17-3. |
| **S/A5d: Deck Welds** \| Inspect floor and roof deck welds. | **1705A.2.2, Table 1705A.2.1 Item 5a.6;** AISC 360 (AISC 341 as applicable); AWS D1.3; DSA IR 17-3. |
| **S/A5e: Cold-Formed Steel** \| Inspect welding of structural cold-formed steel. | **1705A.2.5;** AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA. |
| **S/A5f: Stairs and Railing** \| Inspect welding of stairs and railing systems. | **1705A.2.1;** AISC 360 (AISC 341 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA. |
| **S/A5g: Reinf. Steel Weldability** \| Verification of reinforcing steel weldability. | **1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates. |
| **S/A5h: Reinforcing Steel** \| Inspect welding of reinforcing steel. | **Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3. |

| **S/A6. NONDESTRUCTIVE TESTING:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A6a: Ultrasonic** \| Ultrasonic | **1705A.2.1, Table 1705A.2.1 Item 4c, 1705A.2.5;** AISC 341 J6.2, AISC 360 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2. |
| **S/A6b: Magnetic Particle** \| Magnetic Particle | **1705A.2.1, Table 1705A.2.1 Item 4c, 1705A.2.5;** AISC 341 J6.2, AISC 360 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2. |
| **S/A6c:** Not used. | N/A |
| **S/A6d:** Not used. | N/A |
| **S/A6e:** Not used. | N/A |

| **S/A7. STEEL JOISTS AND TRUSSES:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A7a: Fabrication** \| Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist. | **1705A.2.3, Table 1705A.2.3;** AWS D1.1; DSA IR 22-3 for steel joists only. **1705A.2.4;** AWS D1.3 for cold-formed steel trusses. |

| **S/A8. SPRAYED FIRE-RESISTANT MATERIALS:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A8a: Surface and Installation** \| Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents. | **1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.** |
| **S/A8b: Density** \| Test density. | **1705A.15.1, 1705A.15.5, ASTM E605** |
| **S/A8c: Bond: Adhesion/Cohesion** \| Bond strength adhesion/cohesion. | **1705A.15.1, 1705A.15.6, ASTM E736** |

| S/A9. ANCHOR BOLTS AND ANCHOR RODS: | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A9a: Anchor Rods and Bolts** \| Anchor Bolts and Anchor Rods | Identify, sample and test anchor bolts and anchor rods **not** meeting exemptions identified in Section 1 of IR 17-11. |
| **S/A9b: Other Threaded Rods** \| Threaded rod not used for foundation anchorage. | Identify, sample and test threaded rods **not** meeting exemptions identified in Section 1 of IR 17-11. |

| S/A10. STORAGE RACK SYSTEMS: | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A10a: Material Verification** \| Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents. | Table 1705A.13.7 |
| **S/A10b: Fabrication** \| Fabricated storage rack elements. | 1704A.2.5; Table 1705A.13.7 |
| **S/A10c: Anchorage** \| Storage rack anchorage installation. | ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7 |
| **S/A10d: Completed System** \| Completed storage rack system to indicate compliance with the approved construction documents. | Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA. |

| **S/A11. Other Steel** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **S/A11a.** \| Not used. | N/A |
| **S/A11b.** \| Not used. | N/A |
| **S/A11c.** \| Not used. | N/A |
| **S/A11d.** \| Not used. | N/A |
| **S/A11e.** \| Not used. | N/A |
| **S/A11f.** \| Not used. | N/A |
| **S/A11g.** \| Not used. | N/A |
| **S/A11h.** \| Not used. | N/A |
| **S/A11j.** \| Not used. | N/A |
| **S/A11k.** \| Not used. | N/A |
| **S/A11m.** \| Not used. | Not used. |
| **S/A11n.** \| Not used. | Not used. |

| **W1. PREFABRICATED WOOD TRUSSES:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **W1a: Open Web Truss Fabrication** \| Inspect fabrication of manufactured open-web trusses. | **1705A.5.6;** DSA IR 23-8. |
| **W1b: Metal Plate Truss Fabrication** \| Inspect fabrication of manufactured metal-plate- connected trusses. | **1705A.5.6, 1705A.5.7;** DSA IR 23-4. |

| **W2. MANUFACTURED WOOD STRUCTURAL ELEMENTS:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **W2a: GLS Timber Fabrication** \| Inspect fabrication of structural glued-laminated timber.* | * See **1705A.5.5** for exceptions |
| **W2b: CLT Fabrication** \| Inspect fabrication of cross-laminated timber. | **1705A.5.5** |
| **W2c: Mass Timber Erection** \| Inspect erection of mass timber. | **Table 1705A.5.3**, Item 2 |
| **W2d: Connections Type A** \| Inspect mass timber connections with threaded fasteners, bolts, and/or adhesive anchors other than described in item e below. Inspect concealed mass timber connections. | **Table 1705A.5.3**, Items 3.1, 3.3, 3.4, 3.5. For threaded fasteners: Verify use of proper installation equipment. Verify use of pre-drilled holes where required. Inspect screws, including diameter, length, head type, spacing, installation angle, and depth. |
| **W2e: Connections Type B** \| Inspect mass timber connections with adhesive anchors installed in a horizontal or upward orientation. | **Table 1705A.5.3**, Item 3.2 |
| **W2f: Sealants** \| Inspect application of sealants or adhesives applied to mass timber elements. | **1705A.20** |

| **W3. OTHER Wood:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **W3a.** \| Not used. | N/A |
| **W3b.** \| Not used. | N/A |
| **W3c.** \| Not used. | N/A |
| **W3d.** \| Not used. | N/A |
| **W3e.** \| Not used. | N/A |
| **W3f.** \| Not used. | N/A |
| **W3g.** \| Not used. | N/A |
| **W3h.** \| Not used. | N/A |
| **W3j.** \| Not used. | N/A |
| **W3k.** \| Not used. | N/A |
| **W3m.** \| Not used. | Not used. |
| **W3n.** \| Not used. | Not used. |

## Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

| **X1. OTHER:** | |
|---|---|
| **Test or Special Inspection** | **Code References and Notes** |
| **X01.** \| Load test for identified product(s): | 1709A.2, 1709A.3. Testing is not required for: 1) a product with a valid evaluation service report per DSA IR A-5, or 2) a product that can be justified by structural calculation. |
| **X02.** \| Installation torque for non-HS bolts on communication tower identified as essential service facility projects (ESFP). | Calibrated wrench use required, verified by SI during installation. DSA Policy PL 18-01: Communication Towers, Poles and Buildings Utilized by State Agencies for Essential Services Communications. *EXCEPTION: Non-ESFP may use PI without need for notification to DSA. |
| **X03.** \| Not used. | N/A |
| **X04.** \| Not used. | N/A |
| **X05.** \| Not used. | N/A |
| **X06.** \| Not used. | N/A |
| **X07.** \| Not used. | N/A |
| **X08.** \| Not used. | N/A |
| **X09.** \| Not used. | N/A |
| **X10.** \| Not used. | N/A |

# EXEMPTIONS

| **SOILS - EXEMPTIONS:** |
|---|
| **Soils: Eligible shallow foundation elements** \| Shallow foundations, are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception Item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC, Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12". These exempt structures shall be identified on the approved construction documents. |
| **Soils: Eligible deep foundation elements, Type 1** \| Deep foundation acting as cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report are exempt from special inspection and testing by a Geotechnical Engineer for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.). These exempt structures shall be identified on the approved construction documents. |
| **Soils: Eligible deep foundation elements Type 2** \| Deep foundation acting as cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report are exempt from special inspection and testing by a Geotechnical Engineer for the following cases: A) single-story open fabric shade structure, or B) covered walkway structure with an apex height less than 10'-0" above adjacent grade. These exempt structures shall be identified on the approved construction documents. |

| **CONCRETE/MASONRY - EXEMPTIONS:** |
|---|
| **Concrete/Masonry: Eligible post-installed anchors** \| Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment – see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below. |
| **Concrete: Batch plant inspection for items listed in and complying with CBC Section 1705A.3.3.2.** \| Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section. |
| **Concrete: Epoxy shear dowels in nonstructural slab-on-grade per CBC Section 1910A.5.4, Exception #4.** \| Epoxy shear dowels in site flatwork and/or other nonstructural concrete. |
| **Concrete/Masonry: Reinforcing bar testing for items listed in and complying with CBC Section 1910A.2.** \| Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section. These exempt structures shall be identified on the approved construction documents. |
| **Masonry: Freestanding site walls and retaining walls per DSA IR 21-1.** \| Freestanding and site retaining masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. |
| **Eligible precast elements** \| Structural tests and special inspections are not required for the following concrete precast elements. Provide a certificate of compliance at delivery. Exemptions shall be identified on the approved construction documents.<br>1. Underground vaults no greater than 5 feet x 5 feet x unlimited height and pipe manufactured to an ASTM standard, 5 foot or less in diameter.<br>2. Elements manufactured in a PCI or NPCA certified manufacturing plant: |

| |
|---|
| A. Underground vaults no greater than 16 feet in both length and width, of unlimited height, not subject to loading greater than HS 20-44.<br>B. Pipe.<br>C. Stair treads, landing planks. |

| **WELDING - EXEMPTIONS:** |
|---|
| **Welding: Eligible fences and gates** \| Fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. |
| **Welding: Eligible railing and ramps** \| Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade; fillet welds shall not be ground flush. |
| **Welding: Eligible interior cold-formed steel framing** \| Non-bearing non-shearwall interior cold-formed steel framing spanning less than 15'-0" in height and header less than 10'-0" in opening width, such as in interior partitions, interior soffits, etc. |
| **Welding: Eligible equipment curbs** \| Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection.) |
| **Welding: Eligible components supporting MEP distribution systems** \| Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection.) |
| **Welding: Eligible mounts and recreational equipment** \| TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection.) |
| **Welding: Eligible nonstructural components** \| Any support for exempt non-structural components given in CBC Section 1617A.1.18 meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, and <20# for discrete units or <5 plf for distributed systems. |

**ss**

## SECTION 01 5000 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

1.1 SUMMARY

A. Provide construction facilities and temporary controls needed for the Work including, but not necessarily limited to:
1. Temporary utilities such as heat, water, electricity, and telephone;
2. Field offices;
3. Sanitary facilities;
4. Enclosures such as tarpaulins, barricades, safety devices, and canopies;
5. Temporary fencing of the construction site and/or buildings as required to secure the project;
6. Temporary protect of new and existing work;
7. Project sign.
8. Temporary protection of existing buildings and site.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work is not part of this Section.
3. Permanent installation and hookup of the various utility lines are described in other Sections.

1.2 QUALITY ASSURANCE

A. Comply with governing regulations and rules/recommendations of utility companies and governmental agencies having jurisdiction.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

## PART 2 - PRODUCTS

2.1 TEMPORARY UTILITIES

A. Water:
1. Provide necessary temporary piping and water supply and, upon completion of the Work, remove such temporary facilities.
2. Provide and pay for water used in construction.

B. Electricity:
1. Provide all necessary temporary poles and wiring and, upon completion of the Work, remove such temporary facility.
2. Provide area distribution boxes so located that the individual trades may furnish and use 100 ft maximum length extension cords to obtain power and lighting at points where needed for work, inspection, and safety.
3. Provide lighting as needed to permit safe and reasonable lighted working conditions.
4. Provide and pay for electricity used in construction.

C. Provide for and maintain safety during construction per Chapter 33 of the 2022 California Fire Code and DSA Bulletin 24-05. Within 7 calendar days of the Notice of Award, the Contractor shall meet with the Owner, develop a Site Safety Plan (SSP) and submit the SSP in .pdf format to the Architect who will submit the SSP to DSA for review. Additional contract time will not be granted for failure of DSA to approve the Contractor's plan. At a minimum, the SSP shall include the following information required in CFC Section 3303.1.1:
   1. Name and contact information of site safety director.
   2. Documentation of training of the site safety director and fire watch personnel.
   3. Procedures for reporting emergencies.
   4. Fire department vehicle access routes.
   5. Locations of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
   6. Smoking and cooking policies, designated area to be used where approved, and signage locations in accordance with CFC Section 3305.8.
   7. Location and safety considerations for temporary heating equipment.
   8. Hot work (welding, roofing, etc.) plan.
   9. Plans for control of combustible waste.
   10. Locations and methods for storage and use of flammable and combustible liquids and other hazardous materials.
   11. Provisions for site security.
   12. Changes that affect this plan.
   13. Other site specific information requested by the local fire authority (LFA).

D. Safeguards During Construction: Provide for and maintain safeguards during construction and/or alteration of a building per Chapter 33 of the 2022 California Building Code.

E. Heating: Provide and maintain heat necessary for proper conduct of operations and temperature conditions needed for the Work.

F. Ventilation: Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and prevent accumulation of dust, fumes, vapors, or gases.

G. Telephone/Fax:
   1. Make necessary arrangements and pay costs for installation and operation of telephone, FAX, internet service and copier service in the Contractor's office at the site.
   2. Provide telephone and fax lines in the office of the Project Inspector for use in connection with the Work.
   3. Costs of telephone and fax calls in the Inspector's office are not in contract.

2.2 FIELD OFFICES AND SHEDS

A. Office Facilities:
   1. Contractor's Office: Provide a field office (8' by 12' minimum size) and sheds adequate in size and accommodation for Contractor's offices, supply, and storage.
   2. Secure portable or mobile buildings when used. Provide steps and landings at each doorway. Meet all applicable codes and regulations.
   3. Remove all facilities when they are no longer needed, but only after approval of the Architect.
   4. Inspector's Office: Provide a private space within the field office (8' by 16' minimum size), or a separate job trailer with adequate heating and cooling, power, and telephone outlets for the Project Inspector and for holding project meetings.
      a. Provide 30"x84" table and 8 chairs.
      b. Provide windows (approximately 10% of floor area) oriented to the construction areas.
      c. Provide plan table and stool for inspector.

B. Sanitary Facilities:
   1. Provide temporary sanitary facilities in the quantity required for use by all personnel per local and state health and sanitary regulations.
   2. Maintain in a sanitary condition at all times and in reasonable proximity of the work.

2.3 TEMPORARY ENCLOSURES

A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, lighting, and other temporary construction necessary for the safe and proper completion of the Work in compliance with pertinent safety and other regulations.

B. Provide and maintain suitable temporary sidewalks, closed passageways, fences, and other structures required by law so as not to obstruct or interfere with traffic in public streets, alley ways, or private right-of-way. Leave an unobstructed way along public and private places for pedestrians and vehicles.

C. Provide temporary partitions and ceilings as needed to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

2.4 TEMPORARY FENCING

A. Provide and maintain temporary fencing for the duration of construction to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.

B. Minimum fence height shall be 6'-0" high. Fence panels shall be stretched over 4-sided pipe frames.

2.5 VEHICULAR ACCESS AND PARKING

A. Access the site as indicated on the Drawings, or as directed by the Owner.

B. Do not use existing parking areas for the Contractor's parking or storage of materials.

C. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on the site.

D. Construct and maintain temporary roads accessing public thoroughfares to serve construction area. Extend and relocate as the Work requires.

E. Provide and maintain access to fire hydrants, free of obstructions, with an all-weather hard surface able to support 50,000 pounds minimum fire apparatus. Fire hydrants shall be charged and accessible by local fire authorities prior to loading the site with combustible materials.

F. Employees vehicles not required for the direct construction of the Work shall be parked offsite unless otherwise authorized by the Owner.

2.6 DUST PROTECTION

A. Provide dust suppression measures, including watering of all graded or excavated material at least twice a day, stopping grading and excavation activities when the wind speed exceeds 20 mph for one hour, watering or covering all material transported off-site, and minimizing the area disturbed by grading and excavation

activities.

B. Maintain adequate water and trucks to be used throughout the progress of the project to mitigate airborne dust. Maintain the site in a damp condition, not allowing excessive powdering of soil.

2.7 PROTECTION

A. Landscaping: Protect all existing trees, shrubs, lawns, and landscape work from damage, providing guards and coverings. Maintain by irrigation any existing trees, shrubs, lawns, and landscape work though-out the Contract which are within the Contractor's temporary fencing. Damaged landscaping shall be repaired or replaced at the Contractor's expense.

B. Public and Private Streets, Curbs, and Walks:
1. Protect all existing streets, curbs, walks, and other street improvements and immediately make all necessary repairs for damage occurring thereto during the course of the Work at the Contractor's expense.
2. Keep all public and private streets and ways clean of debris, spilled materials and products, and wet and dry earth at all times and clean at the end of each working day. Clean wet earth from vehicles prior to their leaving the site.

C. Weather: Provide protection at all times against weather--rain, winds, storms, frost, or heat--so as to maintain all work, materials, apparatus, and fixtures free from injury or damage. At the end of the day's work, cover all work likely to be damaged.
1. Water Protection: Protect excavations, trenches, and/or building from damage from rain water, spring water, ground water, backing up of drains or sewers, and all other water at all times. Provide pumps and equipment and enclosure necessary to provide this protection.
2. Drainage: Construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations free of water.
3. Cold Weather: During cold weather, protect all work from damage.
4. Snow and Ice: Remove all snow and ice as may be required for proper protection and/or prosecution of the Work.

D. Installed Roofing Materials: Provide means for protection of roofing materials during construction activities. Provide a minimum of 3/4" plywood as protection for storage or materials, walking areas, and working areas. Protect from solvents, oils, or other materials harmful to the installed roofing material.

E. Existing Utilities and Services: Maintain in operation through-out the Contract all existing utilities and services serving the existing facilities occupied by the Owner or by others.

F. Existing Structures and Improvements: The Contractor shall be responsible for all existing structures and improvements within the work area, and shall provide adequate protection. Any existing structure or improvement damaged during construction shall be repaired or replaced with materials, fixtures, or equipment of the same kind, quality, and size. Any materials, and/or equipment temporarily removed for protection and not damaged, shall be reinstalled.

G. Adjacent Property: Provide necessary protection for adjacent property and the lateral support therefor in conformance with the 2022 California Building Code.

2.8 SECURITY

A. The Contractor shall be responsible for security and protection of his equipment and the site-stored and installed products whether paid for by the Owner or not, until the Owner accepts the Project.

B. On-site security lighting shall be hooded and adjusted to reduce or eliminate illumination of surrounding properties and roadways.

2.9 DEBRIS CONTROL

A. Keep site clean and orderly in appearance at all times. Do not allow debris to accumulate over the site.

B. Collect debris daily and store in a central location or container. Remove from the site monthly prior to review of payment request.

2.10 PROJECT SIGN

A. Provide a project sign bearing the project name and the names of the Owner, Architect, consulting engineers (structural, mechanical, electrical, and civil), and Contractor, company logos, and other information as directed by the Architect. Sign shall be 4’ x 8’ x 1/2”plywood minimum.
   1. Submit sign drawing for review and approval by the Architect.
   2. Place sign in a prominent location as directed by the Architect.
   **3. Sign shall be in place prior to approval of first payment request.**
   4. Maintain sign in place during construction; remove and dispose of sign after project acceptance.

**PART 3 - EXECUTION**

3.1 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Architect.

**END OF SECTION 01 5000**

**SECTION 01 5710 - EROSION CONTROL**

**PART 1 - GENERAL**

1.1 SUMMARY

A. In accordance with pertinent provisions of this Section, install erosion control straw mat, straw wattles, and/or straw bales as needed to meet the requirements of the construction shown in the Contract Documents.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 01 5725: Storm Water Pollution Prevention Plan.
3. Section 31 1000: Site clearing.
4. Section 33 4000: Storm drainage.

1.2 QUALITY ASSURANCE

A. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

B. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the geotechnical engineer.

C. Install erosion control materials prior to expected rainfall and maintain throughout the construction period.

D. Comply with storm water pollution prevention plan.

1.3 SLOPE PROTECTION

A. Minor Slopes: Provide continuous straw mat protection over all soils disturbed by construction operations. Minor slopes shall be slope with finish grade less than 10 horizontal to 1 vertical, up to 6.5 horizontal to 1 vertical.

B. Major Slopes: Provide continuous straw mat protection plus horizontal trench with continuous straw wattles at 4' on center over all soils disturbed by construction operations. Major slopes shall be slope with finish grade equal to or greater than 6.5 horizontal to 1 vertical.

1.4 EXISTING UTILITIES

A. Field verify the location of all existing underground utilities prior to beginning any earthwork. Work around and protect all existing utilities during the course of the Work.

B. Where existing utilities are indicated on the drawings, extreme care shall be exercised in excavating near these utilities to avoid damage, and the Contractor will be held responsible for any damage caused by construction operations.

**PART 2 - PRODUCTS**

2.1 EROSION CONTROL MATTING

A. Erosion control matting shall be straw blanket of 100% agricultural straw fiber matrix with a functional longevity of 6 months or greater. Evenly distribute straw fiber over the entire area of the mat. The blanket shall be covered on the top and bottom with a lightweight photodegradable polypropylene net with mesh size of approximately ½" by ½". Sew blanket together on 1.5" centers with degradable thread.

B. Acceptable Products:
1. North American Green, S150 straw erosion control blanket.
2. Cascade Geotechnical Inc., S-31 LD straw erosion control blanket.
3. Erosion Control Systems, ProGuard SS straw erosion control blanket.
4. Other equal product approved by the Architect.

2.2 STRAW WATTLES

A. Straw wattles are intended to capture and keep sediment on the slopes. Wattles shall be manufactured from 100% agricultural rice straw and wrapped in tubular black plastic netting or hemp. They are approximately 8" in diameter or larger by 25'-30' in length.

B. Acceptable Products:
1. California Straw Works,
2. Other equal product approved by the Architect

2.3 STRAW BALES

A. Provide Straw Bales continuously around all drainage inlets and maintain them to prevent silt build-up in storm drainage pipe. Clean storm drain pipes prior to acceptance of the project and verify there are no obstructions.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 EROSION CONTROL MATTING

A. Provide straw bales as required for loose spreading straw over native disturbed soil during grading operations and foundation and stem wall construction. Fine grade soil as soon after floor and wall framing is complete but before anticipated rainfall.

B. Install erosion control matting at the top of the slope by anchoring the mat into an earthen trench and anchor as recommended by the manufacturer.

C. Roll mats downhill and then horizontally with laps and staples as recommended by the manufacturer.

3.3 STRAW WATTLES

A. Prepare slope with Erosion Control Matting prior to laying the wattling material.

B. Dig and smooth trenches across the slope on contour, to place rolls. Provide trench depth as recommended by the manufacturer, but not less than ½ the diameter of the roll.

C. Trenches shall be placed 4' on center and perpendicular to water flow.

D. Anchor wattles in place with stakes driven and spaced as recommended by manufacturer.

3.4 FIELD QUALITY CONTROL

A. Inspect the erosion control blanket and wattles immediately following the first significant storm. Make sure all rolls are in full contact with soils.

B. Repair any gullys or washouts immediately.

C. Provide gravel or river rock in areas of excessive erosion acceptable to the Architect and at no additional cost to the Owner.

**END OF SECTION 01 5710**

## SECTION 01 5725 - STORM WATER POLLUTION PREVENTION PLAN

### PART 1 - GENERAL

1.1 SUMMARY

A. The State Water Resources Control Board (SWRCB) regulates storm water discharges associated with construction and land disturbance activities. Certain projects are required to obtain permit coverage under California's Construction General Permit (GCP), Order 2022-0057-DWQ. A site-specific Storm Water Pollution Prevention Plan (SWPPP) is required to obtain permit coverage under the CGP.

B. The Central Valley Regional Water Quality Control Board, Region 5F (RWQCB) is the Regional Board responsible for inspections, if any, and enforcing the CGP.

C. Related Sections
1. Section 01 5710: Erosion Control

D. The Owner or Owner's agent will be responsible for filing the Notice of Intent (NOI) and obtaining permit coverage, and developing a site-specific SWPPP.
1. The Contractor shall assist the owner in completing the NOI by providing information requested by the owner or the owner's agent.
2. The Owner has prepared and paid for the Storm Water Pollution Prevention Plan (SWPPP) and this plan is issued with these Contract Documents as an attachment. The entire SWPPP document can be made available either in draft format or final format at the request of the Contractor. The entire SWPPP will be made available for the Contractor to retain on the construction site prior to the scheduled commencement of construction activities.
3. This project is a Risk Level 1 project. All provisions of Attachment C of the CGP shall apply to this project.

E. The Contractor shall obtain a Qualified SWPPP Practitioner (QSP) to oversee compliance with SWPPP requirements, including inspections, recordkeeping, annual reporting, preparation of the Notice of Termination upon project completion, and all other reporting obligations to the State Water Board, for the duration of the project.

F. Nothing in this section shall preclude the Contractor, the Contractor's QSP, or other subcontractors from fully complying with applicable provisions of the CGP.

1.2 REFERENCES

A. National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2022-0057-DWQ, NPDES No. CAS000002.

B. Applicable amendments and/or modifications to Order No. 2022-0057-DWQ

C. California Stormwater Quality Association (CASQA) BMP Handbook, August 2023

1.3 QUALITY ASSURANCE

A. The individual responsible for implementing the SWPPP in accordance with the CGP must be a Qualified SWPPP Practitioner (QSP) for this project and hold such certification from CASQA.

B. The Contractor's QSP shall have an active online account on the State Water Resources Control Board's Storm

Water Multiple Application & Report Tracking System (SMARTS).

C. Install BMPs as directed on the Water Pollution Control Drawing at the appropriate time, and maintain during construction. Remove and replace any damaged or ineffective BMPs.

D. The QSP should use his or her discretion to implement additional BMPs as necessary that may or may not be called out specifically in the SWPPP, and to ensure the construction site complies with the CGP.

E. The QSP shall be responsible for notifying the Qualified SWPPP Developer (QSD) of any significant discrepancies between the Drawing(s) and the actual site conditions. The QSD will make revisions to the SWPPP and issue amendments as applicable. Upon receiving amendments or other revised documents, the QSP shall be responsible for inserting these documents into the SWPPP and keeping them through the life of the Construction project.

F. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.4 SUBMITTALS

A. The Contractor shall submit a copy of the QSP's certificate no later than 1 week prior to the commencement of construction activities.

**PART 2 – PRODUCTS**

2.1 MATERIALS

A. Erosion control products shall comply with those products named in Section 01 5710

B. Provide materials, not specifically described but required for proper completion of the work of this Section, as selected by the Contractor, subject to approval of the Architect.

C. Specific materials shall comply with the Erosion Control Plan/Water Pollution Control Drawings and should comply with the applicable BMP Fact Sheets in the CASQA BMP Handbook.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the site and the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work.

3.2 IMPLEMENTATION

A. The QSP shall implement the SWPPP in accordance with the Contract Documents and as required in the CGP.

B. The SWPPP Binder(s) and other Storm Water Pollution Prevention Documents shall be kept on the construction site at all times. It shall be made readily available for a RWQCB inspector.

C. The construction schedule shall be inserted into the SWPPP Binder and any subsequent revisions to the construction schedule.

D. The QSP shall be responsible for conducting and documenting all training activities in accordance with the CGP. The documentation of the training activities shall be inserted and kept in the project SWPPP. The training activities shall consist of:
   1. Training for individuals responsible for all activities associated with the CGP (i.e. general contractor, site superintendents and subcontractors)
   2. Training for all individuals responsible for BMP installation, inspection, maintenance and repair

E. The QSP shall be responsible for coordinating with the Legally Responsible Person (LRP), or Owner to be added to as a Data Entry Person on the LRP's SMARTS account.

F. The Contractor's QSP shall be responsible for completing and filing all annual reports on SMARTS and shall coordinate with the LRP for necessary certifications. Annual Reports shall be submitted no later than September 1st of each compliance year. The QSP shall complete and file all annual reports as required by the CGP.

G. The QSP shall be responsible for responding to any Notice of Violations (NOVs) or Staff Enforcement Letters (SELs) that may be issued by the RWQCB for non-compliance. The Contractor's QSP shall also be responsible for responding to the RWQCB and preparing any technical reports or other documents that may be requested by the RWQCB.

H. The QSP shall file a Notice of Termination on the SMARTS website no later than 30 days from the completion of the project.

I. If delays in construction occur that cause construction to continue beyond the contracted end date, that are solely the responsibility of the Contractor, the Contractor shall be held responsible for additional costs associated with implementing the SWPPP in accordance with the CGP, and any fines levied by the Regional Water Quality Control Board.

J. At the termination of construction activities and after the Notice of Termination has been approved by the SWRCB, the Contractor shall be responsible for delivering the SWPPP, including all amendments, inspections forms and any other documents added during the course of construction to the Architect.

3.3 FIELD QUALITY CONTROL

A. The Contractor and the Contractor's QSP shall be responsible for ensuring all subcontractors on the site comply with the SWPPP and the CGP and their individual actions do not result in any enforcement actions. The Contractor shall be liable for non-compliance fines from the RWQCB or SWRCB.

B. All construction trades, including their supplies who enter the construction site shall comply with the Good Housekeeping Measures named in Section B of Attachment C of the CGP.

C. Upon commencement of construction, a rain gauge shall be installed on the site in a prominent location where it will not be shielded from rainfall.

D. Install BMPs where noted on the Drawing(s) and maintain as required by the CGP throughout the life of the construction project. BMPs shall be replaced at the discretion of the QSP to comply with the CGP.

E. At the end of each workday all stockpiles shall be covered and protected around their perimeter.

F. All trash and debris shall be cleaned up and properly disposed of at the end of each work day.

G. The QSP or an individual under the direct supervision of the QSP shall conduct all inspections, maintenance repair and sampling activities. Records of inspections shall be kept using a form provided by the SWRCQ,

RWQCB, CASQA, or another alternative format.

H. Upon identification of BMP failures or shortcomings during inspections, effective remedies shall be implemented within 72 hours of identification.

**END OF SECTION 01 5725**

**SECTION 01 6200 - PRODUCT OPTIONS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. This Section describes product options available to bidders and the Contractor.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 01 2500: Substitution procedures.
3. Section 01 3300: Submittal procedures.

1.2 PRODUCT OPTIONS

A. The Contract shall be based on standards of quality established in the Contract Documents.
1. In agreeing to the terms and conditions of the Contract, the Contractor has accepted a responsibility to verify that the specified products will be available and to place orders for all required materials in such a timely manner as is needed to meet his agreed construction schedule.
2. Neither the Owner nor the Architect has agreed to the substitution of materials or methods called for in the Contract Documents, except as they may specifically otherwise state in writing.

B. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer's Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer's standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer's "standard colors" from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.
3. Custom Colors: Where the Finish Schedule indicates a specific manufacturer's colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.3 DELAYS

A. Delays in construction arising by virtue of the non-availability of a specified material due to late approval and/or ordering of materials will not be considered as justifying an extension of the agreed Time of Completion, or reason for change.

B. All additional time required by the Architect or his consultants in dealing with such delay will be charged to the Contractor at the rates described in section 01 7700 1.4.B.2.

C. Equal or better material replacements caused by delay in approvals and/or ordering may cost more than the original material specified. Increased costs shall be absorbed by the Contractor and not the Owner.

**END OF SECTION 01 6200**

## SECTION 01 6600 - STORAGE AND PROTECTION

### PART 1 - GENERAL

1.1 SUMMARY

A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

B. **Materials not properly stored will not be paid for by the owner. Materials previously paid for but not properly stored at time of payment request will be deducted from the request.**

1.3 MANUFACTURERS' RECOMMENDATIONS

A. Except as otherwise approved by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.4 PACKAGING

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
1. Maintain packaged materials with seals unbroken and labels intact until time of use.
2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The Architect may reject as noncomplying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION

A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.

B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.6 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

**END OF SECTION 01 6600**

**SECTION 01 7300 - EXECUTION REQUIREMENTS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. This Section establishes administrative and supervisory requirements pertaining to project coordination and general installation provisions.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 COORDINATION

A. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
   1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
   2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Inspection of Conditions: Require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

G. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement. Comply with manufacturer’s installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

F. Provide attachment and connection devices and methods necessary for securing Work. Allow for expansion and building movement.

G. Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

H. Recheck measurements and dimensions prior to starting installation.

I. Install each component during weather conditions and project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

J. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

K. Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.4 SITE CONDITIONS

A. Where existing utilities are indicated on the drawings, extreme care shall be exercised in excavating near these utilities to avoid damage, and the Contractor will be held responsible for any damage caused by construction operations.

B. Should utilities not indicated on the drawings be found during construction, the Contractor shall promptly notify the Architect for instructions as to further action. Failure to do so will make the Contractor liable for any damage arising from construction operations after discovery of these utilities.

3.5 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration until Notice of Completion.

B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Supervise construction activities 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.

**END OF SECTION 01 7300**

**SECTION 01 7330 - CUTTING AND PATCHING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work.

B. Provide boring, fitting, and patching of the Work, as specified, as indicated, and as needed to:
1. Make the several parts fit properly;
**2. Install new work into existing construction.**
3. Uncover work to provide for installing, inspecting, or both, of ill-timed work;
4. Remove and replace work not conforming to requirements of the Contract Documents;
5. Remove and replace defective work; and
6. Remove samples of installed work for testing.

C. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

D. Special Requirements:
1. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection by the Architect of covered work, and remove samples of installed materials for testing.
2. Prior to cutting, notching, or boring of any structural elements, including bearing/shear walls, footings, beams, etc., not specifically detailed in the drawings, obtain approval from the Architect and DSA prior to commencement of work.
3. Do not cut or alter work performed under separate contracts without the Architect's written permission.
4. The Contractor shall provide all encroachment permits or others as required in the right-of-way of any adjacent jurisdiction.

1.2 SUBMITTALS

A. Request for Architect's Consent:
1. Prior to cutting which effects structural safety, submit written request to the Architect for permission to proceed with cutting.
2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and secure his written permission and the required Change Order prior to proceeding.

B. Notices to Architect:
1. Prior to cutting and patching performed pursuant to the Architect's instructions, submit cost estimate to the Architect. Secure the Architect's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.
2. Submit written notice to the Architect designating the time the Work will be uncovered, to provide for the Architect's observation.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

## PART 2 - PRODUCTS

2.1 MATERIALS

A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

2.2 PAYMENT FOR COSTS

A. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is submitted by the Contractor. Perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

B. For uncovering work and replacement of work for inspection by the Architect:
   1. If work is not compliant, Contractor shall pay all costs,
   2. If work is compliant, Owner shall pay for removal and replacement as a Change Order.

## PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection: Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling. After uncovering the work, inspect conditions affecting installation of new work.

B. Discrepancies: If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions. Do not proceed until unsatisfactory conditions are corrected.

3.2 BORING

A. Provide mechanical boring equipment to bore under existing asphalt, concrete, or other surfaces or objects as noted on the drawings. All borings shall be a minimum of 24" under the substrate material unless otherwise authorized by the Architect.

B. Holes shall be bored not to exceed 1" larger diameter than the largest component remaining in the excavation.

C. **Water or air pressure jetting** are not permitted, unless they comply with the following requirements.
   1. All surfaces of the hole can be visually inspected with 6' maximum length and,
   2. all objects shall be supported continuously to prevent sagging and,
   3. the hole shall be filled with compacted damp sand and inspected by the Project Inspector or Materials Testing lab technician.

3.3 PREPARATION PRIOR TO CUTTING

A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

B. Provide protection for other portions of the work which may be affected.

C. Provide protection from the elements when needed.

3.4 CUTTING AND REMOVAL - GENERAL

A. Perform required excavating and backfilling as required under pertinent other Sections of these Specifications.
   1. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.
   2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

B. Remove existing work indicated to be removed, or as needed for installation of new work.

3.5 MATCHING AND PATCHING

A. Where items are removed from existing walls, ceilings, floors, partitions, or roofs to remain, repair walls, ceilings, floors, partitions, roofs, etc., disturbed by removal.

B. Where existing construction is removed, repair abutting walls, ceilings, floors, partitions, or roofs disturbed by removal.

C. Where existing construction is cut or otherwise disturbed to permit installation of new work, match and patch existing disturbed construction.

D. Use methods similar in appearance, and equal in quality to areas and surfaces being repaired.

E. Remove and replace areas, surfaces, or items which cannot be satisfactorily matched or patched.

**END OF SECTION 01 7330**

**SECTION 01 7400 - CLEANING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection, more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction, including the SWPPP requirements.

C. Contractor shall include the costs of cleaning and trash disposal in his/her bid designate it in the Schedule of Values.

**PART 2 - PRODUCTS**

2.1 CLEANING MATERIALS AND EQUIPMENT

A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

B. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

**PART 3 - EXECUTION**

3.1 PROGRESS CLEANING

A. General:
1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

3.2 FINAL CLEANING

A. "Clean," for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

C. Site: Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site. Completely remove resultant debris.

D. Structures:
   1. Exterior:
      a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter visible from 5'.
      b. Remove all traces of splashed materials from adjacent surfaces.
      c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
      d. In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning at no additional cost to the Owner.
   2. Interior:
      a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter visible from 5'.
      b. Remove all traces of splashed material from adjacent surfaces.
      c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
   3. Glass: Clean inside and outside.
   4. Polished surfaces: Apply polish to surfaces requiring routine application of buffed polish as recommended by the manufacturer of the material.

E. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work.

3.3 CLEANING DURING OWNER'S OCCUPANCY

A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract.

**END OF SECTION 01 7400**

**SECTION 01 7425 - CONSTRUCTION WASTE MANAGEMENT AND CONTROL**

**PART 1 - GENERAL**

1.1 SUMMARY:

A. This section specifies diversion of construction and demolition waste from the landfill. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 01 3110: Additional requirements for project meetings and reports.
3. Section 01 3300: Additional requirements for submittal procedures and project documentation.
4. Section 01 5000: Additional requirements related to trash and waste collection and removal facilities and services.
5. Section 01 6600: Waste prevention requirements related to delivery, storage, and handling.
6. Section 01 7330: Trash/waste prevention procedures related to cutting and patching, installation, protection, and cleaning.
7. Section 31 1000: Handling and disposal of excavated soils and land clearing debris.

C. The following sources may be useful in developing the Waste Management Plan:
1. County engineering or building departments.
2. Sample forms found in “A Guide to the California Green Building Standards Code (Nonresidential)” located at www.bsc.ca.gov/Home/CALGreen.aspx may be used to assist in documenting compliance with the waste management plan.
3. Mixed construction and demolition debris (C&D) processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

1.2 SCOPE OF CONSTRUCTION WASTE MANAGEMENT AND CONTROL

A. Intent: Construction waste management and control is intended to achieve the following specific objectives:
1. Generate the least amount of trash and waste possible.
2. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
3. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

B. Construction Waste Management Requirement: Recycle and/or salvage for reuse a minimum of **65 percent** of the nonhazardous construction and demolition waste in accordance with Option 1, 2 or 3 listed below; or meet a local construction and demolition waste management ordinance, whichever is more stringent.
1. Option 1 - Construction waste management plan. (Cal Green Code 5.408.1.1) Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that:
a. 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.
b. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
c. Identifies diversion facilities where construction and demolition waste material collected will be taken.
d. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

2. Option 2 - Waste Management Company. (Cal Green Code 5.408.1.2) 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.
3. Option 3 - Waste Stream Reduction Alternative. (Cal Green Code 5.408.1.3) 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 percent minimum requirement as approved by the enforcing agency.
4. Documentation: Documentation shall be provided to the enforcing agency which demonstrates compliance with option 1, 2 or 3 above. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

C. Recycling Incentive programs are mandatory for this project; Contractor is responsible for implementation:
1. Any revenue or savings shall accrue to Contractor.
2. Any rebates and credits shall be applied for by Owner and shall accrue to Owner.

D. Owner may decide to pay for additional recycling, salvage, and/or reuse based on Landfill Alternatives Proposal specified below.

E. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
1. Aluminum and plastic beverage containers.
2. Corrugated cardboard.
3. Wood pallets.
4. Clean dimensional wood.
5. Excavated soils and land clearing debris, including brush, branches, logs, and stumps.
6. Concrete.
7. Concrete masonry units.
8. Asphalt paving.
9. Metals, including packaging banding, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
10. Glass.
11. Gypsum board and plaster.
12. Plastic buckets.
13. Carpet, carpet cushion, carpet tile, and carpet remnants.
14. Asphalt roofing shingles.
15. Paint.
16. Plastic sheeting.
17. Windows, doors, and door hardware.
18. Plumbing fixtures.
19. Mechanical and electrical equipment.
20. Fluorescent lamps (light bulbs).
21. Acoustical ceiling tile and panels.

F. Methods of trash/waste disposal that are not acceptable are:
1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.
4. Other Illegal dumping or burying.
5. Incineration either on- or off-site.

G. 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.

1.3 DEFINITIONS:

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and nibble resulting from construction, remodeling, repair and demolition operations. Excavated soils and land clearing debris and hazardous or toxic waste are excluded from construction and demolition waste.

C. Hazardous: Exhibiting the characteristics of hazardous substances (i.e., ignitibility, corrosivity, toxicity or reactivity).

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period or exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. 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.

1.4 SUBMITTALS:

A. General: Submit in accordance with Section 01 3300.

B. Landfill Alternatives Proposal: Within 10 calendar days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs sooner, submit a projection of trash/waste that will require disposal and alternatives to landfilling, with net costs.
   1. Submit to Architect for Owner’s review and approval.

2. If Owner wishes to implement any cost alternatives, the Contract Sum will be adjusted as specified elsewhere.
3. Include an analysis of trash/waste to be generated and landfill options as specified for Waste Management Plan described below.
4. Describe as many alternatives to landfilling as possible:
    a. List each material proposed to be salvaged, reused, or recycled.
    b. List the proposed local market for each material.
    c. State the estimated net cost resulting from each alternative, after subtracting revenue from sale of recycled or salvaged materials and landfill tipping tees saved due to diversion of materials from the landfill.
5. Provide alternatives to landfilling for at least the materials that cannot be recycled, salvaged, or reused as stated under Waste Management Requirements above.
6. Once Owner has determined which of the landfill alternatives addressed in the Proposal above ore acceptable, prepare and submit Waste Management Plan; submit within 10 calendar days after notification by Architect.

D. Submit Waste Management Plan within 10 calendar days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to land filling.

E. Waste Management Plan: Include the following information:
1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
    a. Identify construction waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
    a. Indicate if construction waste materials will be sorted on-site (source separated) or bulk mixed (single stream).
    b. Indicate how the amount of construction waste materials diverted shall be calculated; by weight or volume, but not both.
    c. Indicate deconstruction, salvage, and recycling strategies and processes.
3. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
4. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
    a. List each material proposed to be salvaged, reused, or recycled.
    b. List the local market for each material.
    c. State the estimated net cost versus landfill disposal.
5. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.

F. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
2. Submit Report on a form acceptable to Owner.

3. Landfill Disposal: Include the following information:
   a. Identification of material.
   b. Amount, in tons or cubic yards of trash/waste material from the project disposed of in landfills.
   c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
   d. Include manifests, weight tickets, receipts, and Invoices as evidence of quantity and cost.
4. Incinerator Disposal: Include the following information:
   a. Identification of material.
   b. Amount, in tons or cubic yards of trash/waste material from the project delivered to Incinerators.
   c. State the identity of Incinerators, total amount of fees paid to Incinerator, and total disposal cost.
   d. Include manifests weight tickets, receipts, and invoices as evidence of quantity and cost.
5. Recycled and Salvaged Materials: Include the following Information for each:
   a. Identification of material, including those retrieved by installer for use on other projects.
   b. Amount in tons or cubic yards, date removed from the project site, and receiving party.
   c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
6. Material Reused on Project: include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards.
   c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: include information similar to that described above, as appropriate to disposal method.

G. Recycling Incentive Programs:
   1. Where revenue accrues to Contractor, submit copies of documentation required to qualify for incentive.
   2. Where revenue accrues to Owner, submit any additional documentation required by Owner in addition to information provided in periodic Waste Disposal Report.

**PART 2 - PRODUCTS**

2.1 PRODUCT SUBSTITUTIONS:

A. See Section 01 6200 - Product Requirements for substitution submission procedures.

B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 6200:
   1. Relative amount of waste produced, compared to specified product.
   2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
   3. Proposed disposal method for waste product.
   4. Markets for recycled waste product.

**PART 3 - EXECUTION**

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION:

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings; particularly at:
   1. Pre-bid meeting.
   2. Pre-construction meeting.
   3. Regular job-site meetings.
   4. Job safety meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal for use by all contractors and installers.
   1. As a minimum, provide:
      a. Separate area for storage of materials to be reused on site, such as wood cut-offs for blocking.
      b. Separate dumpsters for each category of recyclable.
      c. Recycling bins at worker lunch area.
   2. Provide containers as required.
   3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
   4. Provide materials for barriers and enclosures that ore nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
   5. Locate enclosures out of the way of construction traffic.
   6. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
   8. Keep recycling and trash/waste bin areas neat and clean and dearly marked In order to avoid contamination of materials.

F. Excavated Soils and Land Clearing Debris: 100% of trees, stumps, rocks, and associated vegetation and soils resulting primarily from land clearing shall reused or recycled, except for reuse, either on site or off site of vegetation or soil contaminated by disease or pest infestation.
   1. For a phased project, such material may be stockpiled on site until the storage site is developed.
   2. 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.
   3. See www.cdfa.ca.gov/exec/county/county_contacts.html.

G. Hazardous or Toxic Waste: Separate, store, and dispose of hazardous waste according to applicable regulations.

H. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility In order to prevent contamination of recyclable materials.

I. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

J. Salvage: Set aside, sort, and protect products to be salvaged for reuse oft-site.

**END OF SECTION 01 7425**

**SECTION 01 7700 - CONTRACT CLOSEOUT**

**PART 1 - GENERAL**

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for an orderly and efficient transfer of the completed Work to the Owner.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 01 3300: Submittal procedures.
3. Section 01 4520: Payment procedures for retesting.
4. Section 01 7400: Final cleaning.
5. Section 01 7820: Operation and maintenance data.
6. Section 01 7840: Project record documents.
7. Certifications and Warranties as noted in each specification section.

1.2 QUALITY ASSURANCE

A. Prior to requesting inspection by the Architect, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Complete the following prior to requesting inspection for substantial completion.
1. Prepare and submit the list of items to be completed or corrected required by the General Conditions.
2. Closeout Submittals:
a. Prepare and submit an electronic submittal of each closeout submittals including, but not limited to, the following:
i. In-Service Certifications required by Divisions 1 through 33 of the specifications executed by the appropriate persons on form provided in this Section.
ii. Project Asbestos Certification executed by Contractor on form provided in this Section;
iii. Project record documents complying with the requirements of Section 01 7840;
iv. Project Warranty executed by the Contractor on form provided in this Section.
v. Special warranties as specified in Divisions 1 through 33 of the specifications.
vi. Maintenance agreements required by Divisions 1 through 33 of the specifications;
vii. Operation and maintenance manuals required by Divisions 1 through 33 of the specifications complying with the requirements of Section 01 7820;
viii. Manufacturer's recommended cleaning procedures required by Divisions 1 through 33;
ix. Certifications required by Divisions 1 through 33 of the specifications.
x. Test reports required by Divisions 1 through 33 of the specifications.
xi. Final versions of all: submittals, RFIs, bulletins, change order requests and change orders.
b. Upon the Architect’s acceptance of the Closeout Submittal, provide one complete hard copy in 3-ring binders, including “wet-signature” original documents for the Owner’s record.
3. Advise Owner of pending insurance change over requirements.
4. Obtain and submit releases from governmental agencies having jurisdiction enabling the Owner unrestricted use of the Work and access to service and utilities; include occupancy permits, operating certificates, and similar releases.
5. Deliver special tools, spare parts, extra materials, and similar items.
6. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of

change-over in security provisions.

7. Complete start-up testing and balancing of systems, and instruction and demonstration of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
8. Complete final clean-up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
9. Submit a list of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
10. In the presence of the Owner and the Inspector of Record, locate all utility devices required for control, manipulation, or shut-off of building and site utility systems including, but not limited to cleanouts, valves, dampers, valve boxes, pull boxes, handholes, manholes, etc., whether exposed, concealed, or in-ground.

B. Inspection Procedures:
1. Within 5 days of receipt of Contractor's list of items to be completed or corrected, the Architect will make an "initial inspection" and provide the Contractor with an additional list of discrepancies. When the Contractor corrects the items indicated by the Architect and any other, the Contractor shall notify the Architect for the Final Acceptance Inspection.
2. All closeout submittal items as listed in paragraph 1.3.A above shall be completed prior to Notice of Completion being submitted to the Owner for acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Prior to requesting final inspection for certification of final acceptance and final payment, prepare and submit the following:
1. Final application for payment with release of liens/stop notices and supporting documentation not previously submitted and accepted.
2. Updated final statement, accounting for final additional changes to the Contract Sum;
3. Final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
4. Final liquidated damages settlement statement, where applicable.
5. Payment by the Contractor of all backcharge items, including but not limited to utilities, materials retesting, and reinspections.
6. Contractor's final verified report, DSA-6C.
7. Contractor shall coordinate switch-over of utilities following Substantial Completion and approval of the Architect. Provide proof of payment for electricity, water, gas and other utilities that are a part of this contract.

B. Inspection Procedures:
1. Within 5 days of receipt of Contractor's written request for Final Acceptance Inspection, the Architect will make a "final inspection" to review the "initial inspection" list of discrepancies and identify any additional discrepancies discovered.

2. Reinspection: Should the Contractor not have completed the Work as required by the Contract Documents, not have completed the items identified on the list of discrepancies, or should the Architect reject portions of the Work, all further inspections, time expended, and reimbursable expenses incurred by the Architect, his representatives, or consultants for final acceptance will be considered additional services and will be charged at the following rates:
   a. Project Architect: $265/hr or $530.00 per inspection minimum.
   b. Architect's Representative: $185/hr or $370.00 per inspection minimum.
   c. Consultants: The direct cost to the Architect plus 10% or $400.00 per inspection minimum.
3. The Architect will bill Owner for additional services required by the Architect and/or consulting engineers for such additional inspections, time expended, and reimbursable expenses incurred, and Owner shall be reimbursed by deducting the same amount from the final payment.

4. Determination of necessity for such reinspections will be made by consultation between the Owner and the Architect.

**END OF SECTION 01 7700**

MANGINI

**MANGINI ASSOCIATES INC.**
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Visalia, California 93291
(559) 627-0530

**www.mangini.us**

**Specification Section No._____**

# IN-SERVICE CERTIFICATION

| | | |
|---|---|---|
| **PROJECT:** | **PROJECT NAME**<br>Project Address | **DATE:** |
| **OWNER:** | | **PROJECT NO.:** |
| **ARCHITECT:** | Mangini Associates Inc. | **DSA FILE NO.:** |
| **CONTRACTOR:** | | **DSA APPL. NO.:** |
| **INSPECTOR:** | | |

**IN-SERVICE CONDUCTED BY:**_____

## MATERIALS REVIEWED (Check applicable boxes)

| | | |
|---|---|---|
| ☐ **RECORD DRAWINGS** | ☐ **SAFETY PROCEDURES** | ☐ **SHUT DOWN** |
| ☐ **WARRANTIES** | ☐ **CLEANING PROCEDURES** | ☐ **CONTROLS MANIPULATION** |
| ☐ **MAINTENANCE AGREEMENT** | ☐ **IDENTIFICATION SYSTEMS** | ☐ **EMERGENCY PROCEDURES** |
| ☐ **OPERATION & MAINTENANCE MANUALS** | ☐ **START-UP** | ☐ **NOISE/VIBRATION ADJUSTMENT** |
| ☐ **SPECIAL TOOLS AND PARTS** | ☐ **CONTROL SEQUENCES** | ☐ **EFFECTIVE ENERGY UTILIZATION** |

## ATTENDEES (Please print name and sign below)

**1. DISTRICT FACILITIES REPRESENTATIVE** _____

**2. SITE REPRESENTATIVE** _____

**3. DISTRICT MAINTENANCE REPRESENTATIVES** _____ (Plumbing) _____ (Mechanical)

_____ (Electrical) _____ (Grounds)

**4. OTHERS PRESENT (FOR GENERAL CONTRACTOR, ETC.)** _____ _____

_____ _____

**MEETING DATE:** _____ **TIME OF START:** _____ **TIME OF COMPLETION:** _____

I CERTIFY THAT THE ABOVE NAMED IN-SERVICE COVERED ALL ASPECTS OF THE SPECIALTY FOR WHICH IT WAS CONVENED.

**Signature** _____ **Date** _____

MANGINI

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(559) 627-0530

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# PROJECT ASBESTOS CERTIFICATION

| | | |
|---|---|---|
| **PROJECT:** | **PROJECT NAME**<br>Project Address | **DATE:** |
| **OWNER:** | | **PROJECT NO.:** |
| **ARCHITECT:** | Mangini Associates Inc. | **DSA FILE NO.:** |
| **CONTRACTOR:** | | **DSA APPL. NO.:** |
| **INSPECTOR:** | | |

**TO:** _____

**FROM:** _____

**SUBJECT:** **Asbestos Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed by

(General Contractor)_____

or its subcontractors on the (Name of Project) _____

located at (Street Address, City, State) _____

do not contain Asbestos Containing Building Materials.

_____
Date

_____
Contractor

_____
Address

_____

_____

_____
Telephone

_____
Signature of Contractor

_____
Title

MANGINI

**MANGINI ASSOCIATES INC.**
4320 West Mineral King Avenue
Visalia, California 93291
(559) 627-0530

**www.mangini.us**

# PROJECT WARRANTY

| | | |
|---|---|---|
| **PROJECT:** | **PROJECT NAME**<br>Project Address | **DATE:** |
| **OWNER:** | | **PROJECT NO.:** |
| **ARCHITECT:** | Mangini Associates Inc. | **DSA FILE NO.:** |
| **CONTRACTOR:** | | **DSA APPL. NO.:** |
| **INSPECTOR:** | | |

_____ (Contractor) hereby warrants to the Owner that materials and equipment furnished under the Contract in the (Name of Project) _____
_____
are of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work is free from defects not inherent in the quality required or permitted, and that the Work conforms with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. This warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

If, within 1 year after the date of Substantial Completion of the Work or designated portion thereof, or by terms of an applicable special warranty required by the Contract Documents extending this time period, any of the Work is found to be not in accordance with the requirements of the Contract Documents or proves to be defective in materials or workmanship, the Contractor expressly agrees to correct it, without expense to the Owner, promptly after receipt of written notice from the Owner or his agent to do so unless the Owner has previously given the Contractor written acceptance of the condition. This period of 1 year shall be extended with respect to portions of the Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation of the Contractor to correct the Work shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

Nothing contained in this warranty shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the time period of 1 year, or special extended time periods required by the Contract Documents, for correction of the Work as described above relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

In the event of the Contractor's failure to comply with the conditions of this warranty within 10 days after being notified in writing by the Owner or his agent, the Contractor hereby authorizes the Owner to proceed to have said defects repaired and made good at the Contractor's expense and the Contractor will honor and pay the costs and charges therefor upon demand.

The term "Work" means the construction and services required by the Contract Documents and includes all other labor, materials, equipment and services provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or part of the total construction performed under the Contract Documents.

_____ _____
Date Telephone

_____ _____
Contractor Signature of Contractor

_____ _____
Address Title
_____

_____

## SECTION 01 7820 - OPERATION AND MAINTENANCE DATA

### PART 1 - GENERAL

1.1 SUMMARY

A. To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding products incorporated into the Work, furnish and deliver the data described in this Section and in pertinent other Sections of these Specifications.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Required contents of submittals also may be amplified in pertinent other Sections of these Specifications.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01 3300.

B. Submit an Electronic Submittal preliminary draft of the proposed Manual or Manuals to the Architect for review and comments.

C. Unless otherwise directed in other Sections, or in writing by the Architect, submit one original set of binders of the final Manual to the Architect prior to indoctrination of operation and maintenance personnel.

1.3 QUALITY ASSURANCE

A. In preparing data required by this Section, use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this Section, and skilled in technical writing to the extent needed for communicating the essential data.

### PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE MANUALS

A. Where instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.

B. Format (Preliminary Electronic Submittal):
1. Comply with pertinent provisions of Section 01 3300.
2. Minimum components:
    a. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of all emergency information regarding the installation.
        i. Bookmark all .pdf files to match the table of contents.
    b. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.
    c. Complete nomenclature of all parts of the equipment.
    d. Complete nomenclature and part number of all replaceable parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
    e. All guarantees and warranties issued.

f. Manufacturers' bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturers' data with which this installation is not concerned.
g. Such other data as required in pertinent other Sections of these Specifications.

C. Format (Final Hard Copy):
1. Size: 8-1/2" x 11"
2. Paper: White bond, at least 20 lb weight
3. Text: Neatly written or printed
4. Drawings: 11" in height preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the Manual and provide a drawing pocket inside rear cover or bind in with text.
5. Flysheets: Separate each portion of the Manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
6. Binding: Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the Manual; 3-ring binders will be acceptable; all binding is subject to the Architect's approval.
7. Measurements: Provide all measurements in U.S. standard units such as feet-and-inches, lbs, and cfm; where items may be expected to be measured within ten years in accordance with metric formulae, provide additional measurements in the "International System of Units" (SI).

D. Provide front and back covers for each Manual, using durable material approved by the Architect, and clearly identified on or through the cover with at least the following information:

OPERATING AND MAINTENANCE INSTRUCTIONS

( name and address of Work )

( name of Contractor )

( general subject of this Manual )

( space for signature of )
( the Architect, and approval date )

**PART 3 - EXECUTION**

3.1 OPERATION AND MAINTENANCE MANUALS

A. Preliminary:
1. Prepare a preliminary electronic submittal of each proposed Manual.
2. Show general arrangement, nature of contents in each portion, probable number of drawings and their size, and proposed method of binding and covering.
3. Secure the Architect's approval prior to proceeding.

B. Final: Complete the Manuals in strict accordance with the approved preliminary drafts and the Architect's review comments.

C. Revisions:
1. Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the Manual with the Architect.
2. Following the indoctrination meeting, complete the "In-Service Certification" form and include it as part of the Operation and Maintenance Manual.

3. If the Contractor is required by the Architect to revise previously approved Manuals, compensation will be made as provided for under "Changes" in the General Conditions.

**END OF SECTION 01 7820**

## SECTION 01 7840 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

1.1 SUMMARY

A. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Article 3.1 below and, upon completion of the Work, transfer the recorded changes to a set of Record Documents, as described in Article 3.2 below.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these Specifications.

1.2 SUBMITTALS

A. Comply with pertinent provisions of Section 01 3300.

B. The Architect's approval of the current status of Project Record Documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the Contract.

C. Prior to submitting each request for progress payment, secure the Architect's approval of the current status of the Project Record Documents.

D. Prior to submitting request for final payment, submit the final Project Record Documents to the Architect and secure his approval.

1.3 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Architect.

B. Accuracy of Records:
1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
2. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.

C. Make entries within 24 hours after receipt of information that the change has occurred.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.

B. In the event of loss of recorded data, use means necessary to secure data to the Architect's approval.
1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.

2. In such case, provide replacements to the standards originally required by the Contract Documents.

**PART 2 - PRODUCTS**

2.1 RECORD DOCUMENTS

A. Record Documents:
1. Job Set: Promptly following receipt of the Owner's Notice to Proceed, secure from Architect, at no charge to Contractor, one complete set of all Documents comprising the Contract, and post all addenda.
2. Post all requests for information, bulletins, and change orders as they occur.
3. Show all underground utility locations and routings by horizontal and vertical dimension.
   a. Record width of trenches in cases were multiple pipes or conduits are installed.
   b. Record the number and sizes of pipes and conduit where trench combines power, fire alarm, and communications.
4. Show all overhead utility locations and routings by horizontal and vertical dimension.
5. At a time nearing completion of the Work, submit the Job Set to the Architect for review.

B. Preliminary Record Documents Submittal:
1. Make an electronic PDF format color copy of the Job Set and submit to the Architect for review.
   a. Bookmark each sheet with sheet number and title to match the sheet index on the cover sheet of the drawings.

C. Final Record Documents:
1. Upon the Architect’s acceptance of the Job Set, make one complete copy of all sheets, including copies of the backs of sheets used to post record information, and including added sheets used to post record information. This copy shall be submitted to the Architect for distribution to the Owner.
2. Include an electronic PDF format color copy of the accepted Job Set.

**PART 3 - EXECUTION**

3.1 MAINTENANCE OF JOB SET

A. Immediately upon receipt of the job set described in Paragraph 2.1.A above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET", and post all addenda.

B. Preservation:
1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the Job Set to the approval of the Architect.
2. Do not use the Job Set for any purpose except entry of new data and for review by the Architect.
3. Maintain the Job Set at the site of Work as designated by the Architect.

C. Making Entries on Drawings:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
2. Date all entries.
3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
4. In the event of overlapping changes, use different colors for the overlapping changes.

D. Make entries in the pertinent other Documents as approved by the Architect.

E. Conversion of Schematic Layouts:
1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.

a. Final physical arrangement is determined by the Contractor, subject to Architect's approval.
b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.

2. Show on the Job Set, by dimension accurate to within one inch, the centerline of each run of items such as are described in subparagraph 3.1.E.1 above.
   a. Clearly identify the item by accurate note such as "cast iron drain", "galv. water", and the like.
   b. Show, by symbol or note, the vertical location of the item ("under slab", "in ceiling plenum", "exposed", and the like).
   c. Make all identification so descriptive that it may be related reliably to the Specifications.
3. The Architect may waive the requirements for conversion of schematic layouts where, in the Architect's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

3.2 FINAL PROJECT RECORD DOCUMENTS

A. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

B. Method of Showing Changes:
   1. Carefully record change data, coordinating the changes as required.
   2. Clearly indicate at each affected detail and other Drawings a full description of changes made during construction, and actual location of underground and overhead utility locations and routes.
   3. Call attention to each entry by drawing a "cloud" around the area or areas affected.
   4. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.

3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

**END OF SECTION 01 7840**

**SECTION 02 2620 – HAZARDOUS MATERIAL ABATEMENT**

**PART 1 - GENERAL**

1.1 SUMMARY

A. In accordance with pertinent provisions of this Section, carefully abate and remove from the site those items scheduled to be so demolished and removed. Section includes:
   1. Abatement of asbestos containing materials.
   2. Abatement of lead containing materials.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   2. Section 00 3100: Existing building survey; information about known hazardous materials.
   3. Section 01 5000: Temporary enclosures, dust control barricades, security at occupied areas, waste removal and cleanup during construction.
   4. Section 01 6600: Handling and storage of items removed for salvage and relocation.
   5. Section 01 7330: Cutting and patching.
   6. Section 01 7420: Construction Waste Management and Control.
   7. Section 02 4210: General demolition.

**PART 2 - EXECUTION**

2.1 SCOPE

A. See attached Hazardous Material Specifications from Forensic Analytical Consulting Services for abatement of Asbestos and Lead containing materials.

**END OF SECTION 02 2620**

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**Hazardous Materials Specifications**
**Hanford Elementary School District**
**Monroe Elementary School Modernization Project**

## Site Information

Monroe Elementary School
300 Monroe Drive
Hanford, CA 93230

## Contacts

Hanford Elementary School District – Daniel Pierotte, Director – (559) 585-3628
Mangini Associates, Inc. – Manuel Acosta, Project Manager – (559) 627-0530
Forensic Analytical Consulting Services, Inc. – Chris Chipponeri, Director – (209) 551-2000

## Background

Hanford Elementary School District (HESD) will be performing a school modernization project at their Monroe Elementary School in Hanford, California. A site survey of the project area found various asbestos containing materials to be present throughout the school which will require abatement by a properly registered and licensed asbestos abatement contractor. In addition, various paints, coatings, and/or ceramic tiles throughout the site have been sampled and were found to be lead-containing and lead-based. The abatement or remediation of materials will be handled in accordance with these specifications.

The contractor awarded the project shall ensure that all applicable aspects of these specifications, as well as Federal, State, and local regulations are followed by either their own firm, or their sub-contractors as applicable for the site work to be completed that impacts asbestos and/or lead paints.

## Scope of Work

### Asbestos

A full survey of project areas was completed by FACS in July 2025 and provides a breakdown of materials on a space-by-space basis with individual amounts of materials present within the space. Contractors shall consult survey report prior to disturbance of materials to verify asbestos-content of materials in their work areas. In the event a material is discovered that was not included in the survey report, work shall halt at the area and FACS notified to conduct testing of the material to verify asbestos-content of the material.

The table on the following page identifies the currently known asbestos-containing materials, building location, percent content and type of asbestos, approximate amount, and US EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP) category based on current architectural drawings.

| MATERIAL | Building Location | ASBESTOS CONTENT & TYPE | APPROXIMATE AMOUNT* | NESHAP CATEGORY** |
|---|---|---|---|---|
| Canvas Wallpaper over Plaster | Building A | 1% Chrysotile | 400 SF | RACM |
| Drywall – Stipple Texture | Building A | 1% Chrysotile | 686 SF | RACM |
| 12" VFT and Mastic – White Oatmeal | Building A | 1% Chrysotile | 219 SF | Category I Non-Friable |
| 6" Baseboard and Mastic – Grey | Building A | 2% Chrysotile | 86 LF | Category I Non-Friable |
| Black Matic Pucks | Building A1 | 7% Chrysotile | 200 SF | Category I Non-Friable |
| Drywall – Tape and Joint Compound Only | Buildings B, C, D, & E | 2% Chrysotile | 650 SF | RACM |
| Vinyl Sheet Flooring (VSF) and Mastic – White with Blue Specks | Buildings C, D, & E | 2% Chrysotile | 648 SF | Category I Non-Friable |
| Linoleum and Mastic – Mauve with Blue Specks | Building C | 2% Chrysotile | 192 SF | Category I Non-Friable |
| Vinyl Baseboard Tile and Mastic | Building A1 | 2% Chrysotile | 4 LF | Category I Non-Friable |
| White Window Patch Sealant | Buildings A & B | 1% Chrysotile | 100 LF | Category II Non-Friable |
| Window Putty | Buildings A & B | 2% Chrysotile | 800 LF | Category II Non-Friable |
| Grey Penetration Mastic | Building A | 3% Chrysotile | 10 SF | Category I Non-Friable |
| Door/Window Frame Sealant | Building A1 | 1% Chrysotile | 160 SF | Category II Non-Friable |
| Door Frame Sealant | Buildings B, C, D, & E | 1% Chrysotile | 320 LF | Category II Non-Friable |
| Light Grey Window Patch Putty | Building B | 2% Chrysotile | 50 LF | Category II Non-Friable |
| Thin White Window Putty | Buildings D & E | 1% Chrysotile | 400 LF | Category II Non-Friable |
| Textured Wood Siding | Buildings H & J | 2% Chrysotile | 3,224 SF | Category II Non-Friable |
| Storefront System Sealant | Buildings H & J | 2% Chrysotile | 260 LF | Category II Non-Friable |
| Textured Siding Sealant | Buildings H & J | 2% Chrysotile | 160 LF | Category II Non-Friable |
| Storefront System Window Putty | Buildings H & J | 3% Chrysotile | 72 LF | Category II Non-Friable |

*Material amounts in Scope of Work are estimates only; contractors are responsible for measuring all materials to be removed for their own bidding purposes.

**Materials rendered friable by removal, or use of mechanical means for abatement of a material, will require notification of the material as friable / RACM to the San Joaquin Valley Air Pollution Control District.

**Lead**

The vast majority of paints and ceramic tiles found during the inspection contain detectable concentrations of lead. The removal or handling of these materials shall be conducted by the abatement contractor or by workers with lead training that meets requirements of regulations, notably the US EPA RRP rule and Cal/OSHA. While ceramic tile requirements are listed below, all work impacting paints or coatings containing any detectable amount of lead will be handled using lead-safe work practices.

The following paints / coatings do not contain lead and would be exempt from lead-safe work practices or specialized lead training for the disturbance of these coatings:

- White Paint on Wood Window Trims – Interior Portable Classrooms
- Green Paint on Metal Door Frames - Buildings A and A1 Main Entry Doorways
- Green Paint on Metal Doors – Main Entry Doors
- Grey Paint on Stucco Wall – Permanent Buildings
- Grey Ramp Coating – Portable Buildings
- Green/Brown Paint on Metal Door – Portable Buildings
- Grey Paint on Wood Siding – Portable Buildings
- Green Paint on Metal Flashing – Portable Buildings
- Grey Paint on Metal Framing – Portable Buildings
- Green Paint on Wood Trim – Portable Buildings

**Project Requirements**

Contractor performing asbestos abatement work must be registered with the Division of Occupational Safety and Health (DOSH) as an asbestos abatement contractor. Contractor must hold the C-22 asbestos abatement license with an asbestos certification.

In the event that more than 20 square feet of lead-based paint that is “wet-applied” will be disturbed by the project, the contractor must be registered as a US EPA Certified Renovation Firm and the crew supervisor will need to be a US EPA Certified Renovator. The requirements for Certified Renovation Firm applies to the general contractor as well per US EPA requirements for the Renovation, Repair and Painting (RRP) Rule. FACS has identified the following wet-applied lead-based paints found during the inspection of the site for the project and these items include window trim, wood cabinets, wood walls, window sills, metal fire extinguisher boxes. There are a number of requirements included in this Rule and the contractor(s) are responsible for compliance. While this specification may allude to requirements of the Rule, not all requirements are identified and FACS is not responsible for contractor failure to comply by following these specifications alone.

The contractor performing asbestos abatement or lead paint remediation shall provide sufficient manpower and equipment to complete the project in scheduled timeline provided to them.

The contractor shall provide all required documents outlined within these specifications to FACS representatives. In addition, contractor shall provide the Owner with those items required by the US EPA RRP rule for their scope of work to be completed on the project. Failure to provide submittals in timelines provided may cause delay to the project start for review and up to project stoppage if necessary to obtain the submittals.

**Notifications**

Contractor shall submit an asbestos temporary worksite "report of use" notification to the local Cal/OSHA office at least 24 hours prior to commencing work on site.

In addition, a notification shall be filed to the San Joaquin Valley Air Quality Air Pollution Control District for the abatement of regulated asbestos-containing materials on this project. As a courtesy, the abatement of non-friable materials shall be included in the notification as well. Notification shall be filed at least 10 days prior to commencing work on site.

The lead work notification shall be filed with the local Cal/OSHA office in the event that more than 100 square feet of lead-based materials will be removed as part of a contractor's scope of work. This notification shall be filed at least 24 hours prior to lead work commencing.

Copies of the notifications shall be provided to FACS on site project manager at the start of the project and posted onsite. No work may take place until these notifications are provided.

**Submittals**

Contractor is responsible for providing all submittals outlined in Sections 2.31, 2.4, 2.41, and 2.7 of the Asbestos General Requirements. Pre-Start submittals shall be provided to FACS at least 10 working days prior to project start to allow for review and approval.

Daily submittal documents shall be provided at the start of the following day's shift. Failure to submit documents in a timely manner may, at FACS Project Manager's discretion, cause abatement activities to be stopped until all overdue submittals are received. This stoppage of work will not affect contractor's completion date, nor the District's ability to charge liquidated damages for work exceeding scheduled completion date of the abatement work.

Submittals may be provided either electronically by CD/DVD, e-mail or other electronic means or as a hard (paper) copy.

**Work Days and Hours**

This project is anticipated to be conducted Monday – Friday, 7:00 am to 3:30 pm. Alternative / Additional days or hours may be worked if contractor's request is approved by Hanford Elementary School District, FACS, and General Contractor. The request for alternative/additional days and/or hours must be submitted at least 48 hours prior to the work shift commencing.

The General Contractor will provide a formal schedule for the project and will need to be met by the selected abatement subcontractor.

**Disposition and Storage of Items**

The District will be responsible for the movement and replacement of all loose furniture and items within the work area. If contractor removes any items for their convenience, they are responsible for the secure storage

of item and reinstallation when completed with work. Contractor is responsible for any damage to those items they remove for their convenience.

**Security and Safety**

Contractor is responsible for the security of their equipment onsite and work area. This includes securing any openings used at exteriors for the exhaust of negative air machines. The openings used shall be secured with at least ½" plywood and tamper-proof bolts. Contractor may stage supplies and equipment in the adjacent classroom areas, but no waste may be stored within a building beyond the work shift.

At a minimum, a tailgate safety meeting shall be held by the contractor's supervisor at the start of the project and at least weekly thereafter. Additional safety meetings may be required if job hazards change during the project or an accident occurs. Copies of safety meeting agenda, including a signed list of workers that attended, shall be provided to the FACS Project Manager.

**Occupancy**

Except for emergency repair activities, the abatement contractor will have exclusive access to the area of abatement. Other site staff or trades may be working in adjacent areas of the site during the work.

**HVAC, Water, and Electricity**

Water and electricity are available onsite, but long cords and hoses may be required. Contractor shall provide a GFCI at each electrical train primary plug-in for equipment to be used. If connections of hoses are necessary, Contractor shall provide seals to prevent leaking at connections of hoses. Contractor is responsible for costs to repair or replace any damage caused by their use of District systems.

HVAC units with intakes within the regulated area of work, including a buffer area to account for liability, will be shut down during asbestos abatement activities. The contractor shall coordinate with general contractor and/or District personnel for the shutdown of units as needed before covering with poly sheeting as critical barriers.

**Equipment**

All equipment to be used on this project shall arrive onsite clean and in proper functioning order. HEPA-vacuums shall have bags which are free of debris and dust, and all equipment shall be free of visible debris or dust from any source.

All equipment that arrives onsite must be in proper functioning order. Ladders may not be missing feet, cords must not be cut or missing grounds, etc.

Any equipment that arrives onsite dirty or not in proper functioning order will be removed from the site at no extra charge to the Owner for cleaning or repairs/replacement.

**Training**

All workers used to perform abatement of asbestos-containing materials must have current AHERA worker training certificates. One worker on the work crew must be a valid AHERA Contractor-Supervisor. The AHERA Contractor-Supervisor shall remain on site at all times while abatement activities are underway.

As noted above, workers disturbing lead-containing or lead-based paints must have lead training in accordance with Cal/OSHA and US EPA RRP requirements. Proof of training may be requested by Owner or Owner's representative(s) and Contractor shall have proof of training onsite during any lead work activities.

Copies of workers asbestos training certifications shall be provided to the FACS Project Manager for approval prior to any work, including containment setup, being performed onsite.

**Personal Protection Equipment**

Personnel entering an asbestos or lead regulated work area will wear respiratory protection consisting of half-mask respirator fitted with HEPA (P-100) filters. In the event a mastic solvent is used for the abatement of floor mastic material, respirators shall be fitted with stacked HEPA/Organic Vapor filters.

Disposable coveralls of Tyvek-quality with attached hood and booties are required to be worn in regulated areas. For interior asbestos abatement containment area, street clothes shall not be worn below disposable coveralls. Street clothes may be worn beneath disposable coveralls for exterior work areas and lead work areas, but HEPA-vacuum cleaning of clothing in the event that suits become ripped or torn will be required.

Workers shall also wear gloves and safety glasses when entering a regulated work area. Hard hats shall be worn when performing plaster, drywall and window abatement.

Contractor may opt to increase personal protection equipment based on their own job hazard assessment, but at no time shall be less than items identified above.

Current copies of each worker's fit test and medical clearance shall be provided to FACS Project Manager for approval prior to any work being performed onsite.

**Personal Air Monitoring**

The contractor shall collect personal air samples for each shift of asbestos abatement and lead removal activities. Personal samples shall be collected in accordance with Cal/OSHA requirements. Samples results shall be provided to the FACS Project Manager within 72 hours of collection. Failure to submit personal sample results in a timely fashion will result in contractor being required to raise respiratory protection for all workers conducting asbestos abatement or lead remediation on this project or even halting of work until results are received. Respiratory protection will be evaluated based on both contractor and FACS air sampling data to determine if an increase is necessary to sufficiently protect worker health.

**Challenge Testing**

All HEPA-filtered equipment used on this project shall be challenge tested onsite prior to the use of equipment. Testing must be completed by a testing company independent of the contractor. Copies of the

challenge test results shall be provided to the FACS Project Manager prior to the use of any HEPA-filtered equipment.

**Air Pressure Differential**

All negative pressure enclosures shall be placed under an air pressure differential of at least -0.030" WC. This air pressure differential shall be established prior to work commencing and must be maintained through all phases of the project until clearance air sampling (asbestos) or visual inspection (lead) is passed.

The air pressure differential shall be monitored on a recording manometer. Copies of the manometer reading shall be provided to the FACS onsite project monitor daily on 8.5" X 11" pieces of paper.

All negative air machines used to generate air pressure differential shall be exhausted to the exterior of the building using wire-reinforced flex ducting or pre-formed poly "lay-flat" ducting. Contractor is responsible for securing openings used for the negative air machines exhaust.

**Decontamination System**

All interior negative pressure enclosures, with exception of baseboard and wall mastic containment areas, shall have an attached three-stage decontamination system. This system shall be comprised of a "clean" chamber, functioning shower system, and "dirty" chamber. Each chamber shall be at least 3'x3'x7' and a curb of at least 4" shall exist between each chamber, including entry into containment area, to prevent the transfer of debris through the chambers. A self-sealing "z-flap" or similar shall be installed between each chamber and must completely seal in the event of power loss in the work area.

The shower system shall have both hot and cold water that is controllable with a shower head that provides sufficient water pressure to allow personnel to shower out of the containment area. The captured water from showers shall be filtered down to 5 microns prior to discharge into a storm drain. The contractor shall provide soap, shampoo, and towels for workers to use for showering. The decontamination system shall be kept clean at all times.

For exterior work areas, a 6-mil poly drop sheet shall be placed at the edge of the regulated work area. This area shall have water, soap, towels, and a waste bag for disposal of contaminated PPE that will not be decontaminated for re-use. A HEPA-vacuum shall be available for use in cleaning debris from worker clothing in the event that suits become torn during work.

All personnel, waste packaging, and equipment must be decontaminated prior to removal from a regulated work area.

**Water or other liquids may not be consumed in any part of the decontamination system. Workers that need to hydrate will need to shower and exit the decontamination system to access and drink fluids.**

**Pre-Cleaning**

No pre-cleaning of asbestos-containing material or lead-containing dust and debris is required for this project. Limited debris may need to be cleaned to allow sufficient adherence of containment barriers to surfaces.

**Asbestos Abatement and Containment Requirements**

**All poly used for containment setup shall be 6-mil in thickness and fire-retardant unless exempted in requirements below.**

**Vinyl Sheet Flooring / Vinyl Floor Tile / Linoleum and Mastic Abatement Requirements**

1. One layer of 6-mil poly shall be installed and sealed over all openings into the work area as critical barriers.
2. One layer of 6-mil poly may be installed as appropriate to isolate the floor materials being abated within a space from the remainder of the classroom area.
3. One layer of 6-mil poly shall be placed over the wall surfaces within the regulated area for the abatement of materials.
4. One layer of 6-mil poly shall be installed over any fixed items that are not removed prior to containment setup.
5. One layer of 4-mil poly shall be installed over the ceiling within the containment area to assist with establishing the air pressure differential and assist with cleaning at the conclusion of abatement.
6. One layer of 4-mil poly shall be installed over the poly wall surface to act as a splash guard if a floor buffer is used for the abatement of floor mastic. This poly may be removed as part of detail cleaning after gross removal of mastic is completed.
7. Viewports of sufficient size shall be installed into poly critical barrier walls as directed by the FACS onsite project monitor. A minimum of two viewports will be required to be installed for each containment area.
8. Spray glue shall not be used for the installation of poly over surfaces. Wire or similar may be used to uphold the poly ceiling if needed. Contractor is responsible for damage caused by containment setup.
9. A sufficient number of negative air machines shall be installed to provide an air pressure differential of -0.030” WC in the containment area.
10. An airless sprayer and HEPA-vacuum shall be installed in the containment area prior to work commencing.
11. A fire extinguisher shall be installed as required by Cal/OSHA and at minimum at the entry/exit to the decontamination unit and inside the containment area.
12. A three-stage decontamination system shall be attached to the containment area. Requirements for this system are detailed in *Decontamination System* above.
13. Asbestos danger signs shall be installed at all openings into the regulated work area and at the flap leading from the “clean” chamber to the shower in the decontamination system. Signs shall be posted after a pre-start visual inspection has been passed and prior to abatement commencing.
14. Materials shall be wetted with amended water prior to and during removal.
15. Vinyl floor tile materials shall be removed as intact as possible using non-mechanical means.
16. Removal of the floor mastic from concrete substrate using mechanical means is allowable for project. These allowed fashions of removal include floor buffer with solvent, water-jet removal, and handheld grinding of material. Proper engineering controls (local exhaust) and work practices (wet methods) shall be followed for the manner in which contractor opts to remove material.
17. Contractor shall control use of solvent or similar during removal of mastic to ensure it does not run below any fixed cabinetry or out of the containment area.
18. Floor mastic shall be abated from appreciable divots, cracks, etc. within the floor concrete slab. Mastic shall be abated to the point of no three-dimensional debris.

19. No loose or removed but unpackaged material may remain in the work area at a work stoppage. All waste must be packaged or loaded into the waste prior to any work stoppages, including lunch and work breaks.
20. All asbestos waste shall be placed in 6-mil poly waste bags and all waste must be double-bagged. Details of waste disposal are provided below.
21. All cleaning shall be completed by wet-wiping, HEPA-vacuuming, and wet-wiping one more time at minimum.
22. Once removal is completed, the containment area shall be cleaned of all debris, dust, and must be dry to conduct a final visual inspection of the containment area. Clearance criteria for abatement is detailed below.
23. Once a clearance visual inspection has been passed by the FACS onsite project monitor, the contractor may encapsulate the containment poly. Encapsulant shall not be applied to floor surface to prevent damage or adhesion of new floor materials after the project.

**Plaster / Drywall Abatement Requirements**

1. One layer of 6-mil poly shall be installed and sealed over all openings into the work area as critical barriers.
2. One layer of 6-mil poly shall be installed over any fixed items that are not to be removed as part of the abatement project.
3. Two layers of 6-mil poly shall be installed over the floor of the containment area. The top layer of floor poly may be removed as part of the detail cleaning of the containment area. Floor poly is required regardless of the asbestos-content of floor materials that may be present in the space and scheduled for removal as part of the project.
4. Floor poly shall be secured to prevent slippage or movement and creation of a trip hazard.
5. Walls not being impacted and ceiling shall be covered with one layer of 4-mil poly.
6. Any seams in poly shall be overlapped at least 4” to prevent debris from moving below / behind poly.
7. Viewports of sufficient size shall be installed at poly critical barrier walls, doorways, or other locations as directed by the FACS onsite project monitor. Viewports shall measure at least 12” x 12” in size. Contractor shall install at least two viewports around each containment area.
8. Spray glue shall not be used for the installation of poly over surfaces. Contractor is responsible for damage caused by containment setup.
9. A sufficient number of negative air machines shall be installed to provide an air pressure differential of -0.030” WC in the containment area.
10. An airless sprayer and HEPA-vacuum shall be inside containment area prior to work commencing.
11. A fire extinguisher shall be installed as required by Cal/OSHA and at minimum at the entry/exit to the decontamination unit and inside the containment area.
12. A three-stage decontamination system shall be attached to the containment area. Requirements for this system are detailed in *Decontamination System* above.
13. Asbestos danger signs shall be installed at all openings into the regulated work area and at the flap leading from the “clean” chamber to the shower in the decontamination system. Signs shall be posted after a pre-start visual inspection has been passed and prior to abatement commencing.
14. Materials shall be wetted with amended water prior to and during removal.
15. Materials shall be removed using non-mechanical means and as intact as possible.
16. Workers shall remove any nails, screws or other hardware used to attach plaster and/or drywall to framing system of walls or ceilings.

17. Any drywall texture or joint compound overspray will be cleaned from framing as part of detail cleaning. Materials will need to be cleaned to the point of no three-dimensional debris.
18. No loose or removed but unpackaged material may remain in the work area at a work stoppage. All waste must be packaged or loaded into the waste prior to any work stoppages, including lunch and work breaks.
19. All asbestos waste shall be placed in 6-mil poly waste bags and all waste must be double-bagged. Additional details of waste disposal are provided below.
20. All cleaning shall be completed by HEPA-vacuuming, wet-wiping, and HEPA-vacuuming one more time at minimum.
21. Once removal is completed, the containment area shall be cleaned of all debris, dust, and must be dry to conduct a final visual inspection of the containment area. Clearance criteria for abatement is detailed below.
22. Once a clearance visual inspection has been passed by the FACS onsite project monitor, the contractor may encapsulate the containment area.

**Baseboard and Wall Mastic Pucks Abatement Requirements**

When asbestos-containing baseboard or wall mastic puck materials are not abated within the same containment areas as either drywall/plaster or flooring abatement, the following requirements shall be met.

1. One layer of 6-mil poly shall be installed and sealed over all openings into the work area as critical barriers.
2. One layer of 6-mil poly shall be installed over any fixed items that are not to be removed as part of the abatement project.
3. One layer of 6-mil poly shall be installed over the floor of the containment area. Floor poly is required regardless of the asbestos-content of floor materials that may be present in the space and scheduled for removal as part of the project.
4. Floor poly shall be secured to prevent slippage or movement and creation of a trip hazard.
5. One layer of 6-mil poly walls shall be installed to isolate work from remainder of larger classroom space as appropriate.
6. Any seams in poly shall be overlapped at least 4” to prevent debris from moving below / behind poly.
7. Viewports of sufficient size shall be installed at poly critical barrier walls, doorways, or other locations as directed by the FACS onsite project monitor. Viewports shall measure at least 12” x 12” in size. Contractor shall install at least two viewports around each containment area.
8. Spray glue shall not be used for the installation of poly over surfaces. Contractor is responsible for damage caused by containment setup.
9. A sufficient number of negative air machines shall be installed to provide an air pressure differential of -0.030” WC in the containment area.
10. An airless sprayer and HEPA-vacuum shall be inside containment area prior to work commencing.
11. A fire extinguisher shall be installed as required by Cal/OSHA and at minimum at the entry/exit to the decontamination unit and inside the containment area.
12. A two-stage decontamination system shall be attached to the containment area. Requirements for this system are detailed in *Decontamination System* above and the exception for this area is removal of the shower chamber.
13. Asbestos danger signs shall be installed at all openings into the regulated work area and at the flap leading from the “clean” chamber to the dirty chamber in the decontamination system. Signs shall be posted after a pre-start visual inspection has been passed and prior to abatement commencing.

14. Materials shall be wetted with amended water prior to and during removal.
15. Materials shall be removed using non-mechanical means and as intact as possible.
16. Mastic materials shall be scraped from wall surfaces to the point of no three-dimensional material. If allowable for the project, it would be preferable to cut out the wall surface without disturbing the mastic materials with tools at all. Abatement contractor shall coordinate any cutting or removal of wall surfaces with the general contractor to ensure it would be allowable and the extent of removal that may be allowed for future work.
17. No loose or removed but unpackaged material may remain in the work area at a work stoppage. All waste must be packaged or loaded into the waste prior to any work stoppages, including lunch and work breaks.
18. All asbestos waste shall be placed in 6-mil poly waste bags and all waste must be double-bagged. Additional details of waste disposal are provided below.
19. All cleaning shall be completed by HEPA-vacuuming, wet-wiping, and HEPA-vacuuming one more time at minimum.
20. Once removal is completed, the containment area shall be cleaned of all debris, dust, and must be dry to conduct a final visual inspection of the containment area. Clearance criteria for abatement is detailed below.
21. Once a clearance visual inspection has been passed by the FACS onsite project monitor, the contractor may encapsulate the containment area.

**Exterior Abatement Requirements**

1. Contractor shall place one layer of 6-mil poly on the ground below the materials being removed and extend to at least 20 feet out form the work area in each direction. Contractor shall take care when installing ground poly to not damage foliage to the greatest extent possible.
2. Ground poly shall be weighed down or secured to prevent billowing and creation of a trip hazard.
3. Asbestos danger tape or caution tape with asbestos danger signs shall be placed around the poly to establish a regulated area. Contractor shall be prepared to provide pylons or similar to mount barrier tape if a pre-existing fixture is not available.
4. All critical barriers within the work area at the exterior of the building shall be sealed with one layer of 6-mil poly. These barriers shall be cleaned as part of the final detail cleaning of the regulated work area.
5. One layer of 6-mil poly shall be installed at the interior side of spaces for window system or door frame sealant removal to ensure asbestos fibers or lead dust released do not migrate to interior spaces.
6. One layer of poly shall be installed over interior side of spaces at shelving or floors to capture any debris that may fall into the interior space as well.
7. One layer of 6-mil poly drop sheet shall be placed at the edge of the regulated area for decontamination at conclusion of abatement. The details for this area are specified above in *Decontamination System*.
8. Materials shall be removed using non-mechanical means and removed as intact as possible.
9. Materials shall be sufficiently wetted with amended water prior to and during removal to prevent the creation of visible emissions using an airless sprayer.
10. Any nails, screws or other fasteners used to attach material to substrate or building framing shall be removed as part of the detail cleaning of abatement areas.
11. Any residual sealant at the building opening where window systems or door frames have been removed must be abated to the point of no three-dimensional material.

12. All waste shall be double-bagged in 6-mil poly waste bags. Both waste bags shall be sealed in a "gooseneck" fashion to create a leak-tight container. If materials are too large for bagging, they must be wrapped in two separate layers of 6-mil poly with staggered seams to create a leak-tight container.
13. Waste shall be bagged as generated to prevent a build-up of waste within the containment area.
14. All surfaces shall be wet-wiped and HEPA-vacuumed clean at the conclusion of abatement.
15. Upon completion of abatement, and after successful visual inspection has been performed, poly drop sheets shall be encapsulated and allowed to dry before removal of containment poly barriers.

**Lead-Glazed Ceramic Tile Removal**

1. One layer of 6-mil poly shall be installed and sealed over all openings into the work area as critical barriers.
2. Two layers of 6-mil poly shall be installed over the floor surface of the space for the removal of materials. The top layer may be removed as part of detail cleaning of the containment area.
3. One layer of 6-mil poly shall be installed over any fixed items that are not removed prior to containment setup.
4. Viewports of sufficient size shall be installed into poly critical barrier walls as directed by the FACS onsite project monitor. Contractor shall come prepared to install at least one 18" x 18" viewport in each containment area.
5. A sufficient number of negative air machines shall be installed to provide an air pressure differential of -0.030" WC in the containment area. Negative air machines shall be exhausted to the exterior of the building using windows or doorways as available.
6. An airless sprayer and HEPA-vacuum shall be installed in the containment area prior to work commencing. Additional pieces of these items may be required if the work crew is performing abatement within multiple spaces in the larger containment area.
7. A fire extinguisher shall be installed as required by Cal/OSHA and at minimum at the entry/exit to the decontamination unit and inside the containment area.
8. A three-stage decontamination system shall be attached to the containment area. Requirements for this system are detailed in *Decontamination System* above.
9. Lead hazard signs shall be installed at all openings into the regulated work area and at the flap leading from the "clean" chamber to the shower in the decontamination system. Signs shall be posted after a pre-start visual inspection has been passed and prior to removal commencing.
10. Materials shall be wetted with amended water prior to and during removal using the airless sprayer.
11. Tile wall materials shall be removed as intact as possible by peeling the tiles away from the substrate wall surface.
12. Waste shall be bagged as it is generated to prevent the crushing of debris into finer lead dust.
13. Tile materials will be double-bagged within the negative pressure enclosure and disposed of as required by the contractor's waste profile for the waste stream. Additional waste handling detail is provided below.
14. No loose or removed but unpackaged material may remain in the work area at a work stoppage. All waste must be packaged or loaded into the waste prior to any work stoppages, including lunch and work breaks.
15. All cleaning shall be completed by HEPA-vacuuming, wet-wiping, and HEPA-vacuuming one more time at minimum.
16. Once removal is completed, the containment area shall be cleaned of all debris, dust, and must be dry to conduct a final visual inspection of the containment area. Clearance criteria for abatement is detailed below.

**General Lead Paint Handling Procedures**

The requirements identified below may be similar to requirements of the US EPA RRP rule but are not intended to supersede the requirements for compliance with the RRP rule. Any work that is deemed RRP lead work shall follow the requirements of the RRP rule including the collection of wipe verification tests.

1. Openings within 20 feet of the work area shall be sealed with one layer of 6-mil poly as critical barriers. This includes doors, HVAC units, wall louvers, windows, etc.
2. One layer of 6-mil poly shall be placed on the ground and extend out at least 10 feet in each direction. If 10 feet is not sufficient to capture paint chip debris, poly sheeting must be increased, or work practices evaluated, to keep lead paint chips contained.
3. Lead hazard tape or caution tape with lead hazard signage shall be placed around the work area to create a regulated work area. Personal Protection Equipment must be worn within this area.
4. One layer of 6-mil poly shall be placed at the edge of the regulated work area to act as a decontamination area. The details for this area are detailed above in *Decontamination System*. This area shall include soap, wet-wipes/water, and towels to allow workers to decontaminate themselves and equipment as exiting the regulated area. A waste bag shall be provided for the disposal of decontamination waste and personal protection equipment as applicable.
5. Painted/coated components must be impacted using wet methods – pre-wetting surfaces, during impact, and cleaning of the area to limit airborne lead dust generation.
6. HEPA-vacuum cleanup of dust and paint chips generated during the work is required to prevent the crushing of lead debris into finer lead dust.
7. Contractor shall keep regulated area clean and orderly. Paint debris shall not be allowed to build up within the area to prevent the crushing of chips and creation of finer lead dust in the work area.
8. If any powered equipment is used for the impact of paints, the tool must be shrouded with HEPA-filtered local exhaust.
9. The poly drop sheet shall be folded in upon itself and placed into a waste bag once a final visual inspection has been passed.

**Waste Handling Requirements**

Contractor is responsible for providing a waste receptacle on site for the storage of all asbestos-containing materials and/or lead waste. Asbestos and lead wastes cannot be mixed in the same waste bin. In addition, hazardous asbestos-containing materials and non-hazardous asbestos-containing materials shall not be mixed within the same waste bin. Contractor shall provide sufficient waste bins to keep materials segregated.

Waste bins to remain onsite past a work shift must be covered/enclosed with a hard-top lid and lockable to keep waste secured. The waste bins must arrive onsite clean of debris. Waste bins shall be load-worthy and the contractor is responsible for any costs associated with load loss. Waste bins must remain locked at all times with the exception of active loading of waste. Contractor shall coordinate the placement of waste bins with the head custodian of the site and/or General Contractor. Plywood or similar material shall be installed below the feet / casters of the waste bin to prevent damage to concrete or asphalt surfaces.

The waste bin shall be lined with one layer of 6-mil poly prior to loading of waste. This liner does not count as one layer of packaging for waste. All waste must be double-bagged in 6-mil poly waste bags or “burrito-wrapped” in two separate layers of 6-mil poly. Waste bags shall be sealed in a “gooseneck” fashion and wrapped materials shall have staggered tape seals to create a leak-tight container. All waste shall be wet inside

waste bags but may not contain “loose” water. Air within waste bags shall be evacuated using a HEPA-vacuum when sealing.

All waste packages shall be labeled in accordance with Cal/OSHA, DTSC, DOT, etc. requirements as necessary for waste being disposed. All waste must be manifested, even if considered to be non-hazardous. Contractor shall provide at least 24-hour notice of waste manifest needing to be signed to allow coordination with District personnel for signatures. At no time will the contractor, waste hauler or FACS sign waste manifest on behalf of Hanford Elementary School District.

The contractor shall perform a waste profile to determine how to characterize lead waste for disposal. Proof of the waste characterization, including lab report and chain-of-custody, shall be provided to FACS Project Manager prior to disposal of the materials.

**Clearance Criteria**

At the conclusion of abatement, the crew supervisor shall perform own visual inspection of the regulated work area to ensure all materials have been abated and the work area is clean of all dust and debris. Once they pass their own visual inspection, they may request a visual inspection from the FACS onsite project monitor. To pass a final visual inspection, all materials need to be abated, the work area must be dry, and no dust or debris may be present.

For interior asbestos abatement areas, clearance air sampling will be performed in accordance with US EPA AHERA requirements the day following a passing visual inspection. For this project, five (5) clearance air samples will be collected in an aggressive manner within the work area and analyzed by either transmission electron microscopy (TEM) or phase contrast microscopy (PCM) by a laboratory independent of FACS and the contractor. To pass clearance air sampling criteria, the average for a TEM sample set collected must be below 71 structures per square millimeter ($S/mm^2$) and for a PCM sample set all samples must be equal to or below 0.01 fibers per cubic centimeter (Fibers/cc).

Once the contractor is notified that clearance air sampling results have been received, they will dispatch a crew to the work site to either remove containment or re-clean to allow collection of additional clearance air samples no more than 24 hours after notification. The contractor is responsible for all costs associated with the cleaning and collection of additional clearance air samples (both labor to collect, transport, and laboratory analysis fees) beyond the initial clearance set for a containment area until passing clearance air samples are obtained.

For ceramic tile removal areas and exterior asbestos abatement areas, passage of the final visual inspection by FACS will constitute clearance. The containment barriers will be allowed to be removed once encapsulant has been applied and sufficient time has passed to dry and capture any debris that may have been missed during the visual inspection.

As noted above, the contractor performing work regulated under the US EPA RRP rule at interior areas will need to perform wipe verification tests and pass the areas before removing containments as well.

Written by: Chris Chipponeri, CAC #10-4633, LRC-00000782
Date: September 18, 2025

# ASBESTOS GENERAL REQUIREMENTS

**Forensic Analytical Consulting Services, Inc.**
**facs.com**

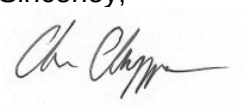
January 1, 2019

To whom it may concern,

The enclosed specifications were created by Hazard Management Services, Inc.(HMS, Inc. or HMS). HMS, Inc. is now Forensic Analytical Consulting Services, Inc. (FACS).

This document has not been updated to reflect our new company name. Any references within this document to Hazard Management Services, Inc., HMS, Inc., or HMS should be presumed to now refer to FACS. If there is any ambiguity or if any clarification is needed regarding this issue, please contact me via email or by phone.

Sincerley,



Chris Chipponeri, Director
Forensic Analytical Consulting Services, Inc.
chris.c@facs.com

# GENERAL ASBESTOS REQUIREMENTS

## SECTION 1. DEFINITIONS

**Abatement -** Procedures beyond a special operations and maintenance program to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, repair.

**ACGIH -** American Conference of Governmental Industrial Hygienists

**AHERA -** Asbestos Hazard Emergency Response Act (40 CFR 763)

**AIHA -** American Industrial Hygiene Association

**Air Filtration Device -** 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.

**Airlock -** A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area. The airlock shall consist of a minimum of two curtained Z-flap 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 Method 7400. For clearance air monitoring, transmission electron microscopy methods may be utilized for detection of smaller fibers and specific fiber identification.

**Air Sampling Professional -** The professional contracted or employed by the Owner to supervise and/or conduct air monitoring and analysis schemes. The air sampling professional must be a Cal/OSHA Certified Asbestos Consultant or Certified Site Surveillance Technician. This individual shall not be affiliated in any way other with the contractor performing the abatement work.

**Ambient Air** - The air outside 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

**Approval/Acceptance** - A written means of approving/accepting a product, containment set-up, work practice. Approval/Acceptance by HMS, Inc. Project Manager may be given verbally, if followed in written format. Failure of HMS, Inc. Project Manager to address an issue either verbally or in writing does not imply Approval/Acceptance.

**Asbestos -** Means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite grunerite (amosite), anthophyllite, actinolite, and tremolite.

**Asbestos-Containing Construction Material (ACCM)** - Cal/OSHA term used to describe construction materials that contain asbestos in amounts greater than one-tenth of one percent (0.1%) either alone or mixed with fibrous or non-fibrous materials. With the exception of waste issues, for the purposes of this contract the terms ACM and ACCM shall be interchangeable.

**Asbestos-Containing Material (ACM) -** Term used by Cal/OSHA, and U.S. EPA to include any material containing more than one-percent (1%) asbestos. With the exception of waste issues, for the purposes of this contract the terms ACM and ACCM shall be interchangeable.

**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 Waste Material -** Asbestos-containing material or asbestos-contaminated objects requiring disposal.

**Asbestos Project Manager** - An individual who is qualified by virtue of experience and education, designated as the Owner's representative and responsible for overseeing the asbestos abatement portion of the project. This person is generally the same as the HMS, Inc. Project Manager.

**ASTM -** American Society for Testing and Materials

**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 has submitted a bid. If bid walk is mandatory, bidder must attend the walk in order for bid to be considered responsive.

**Cal/OSHA -** California Division of Occupational Safety and Health. Acronym of DOSH is interchangeable with this term.

**Certified Industrial Hygienist (CIH) -** An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

**Cleaning Barriers** - Cleaning barriers are used in addition to critical barriers and are primarily to aid in the decontamination of the area after the completion of asbestos removal work. Cleaning barriers are normally comprised of plastic sheeting placed over non-asbestos-containing surfaces (e.g. walls, floors, ceilings, casework, etc.), and asbestos-containing surfaces not scheduled for removal, in the regulated area.

**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. Also, the term includes uncontaminated area or room of a Waste Transfer Airlock.

**Competent Person -** The Contractor's employee who meets the requirements of and is responsible for the activities of the Competent Person as described in Title 8 CCR 1529. The includes but is not limited to an individual who has current AHERA Contractor/Supervisor accreditation and has the responsibility and authority to ensure that the Contractor's employees comply with the contract documents and all relevant Cal/OSHA regulations.

**Containment -** The temporary 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.

**Contractor -** The Contractor is the person or entity identified as such in the Contract Documents; references to "Contractor" include the Contractor's authorized representative.

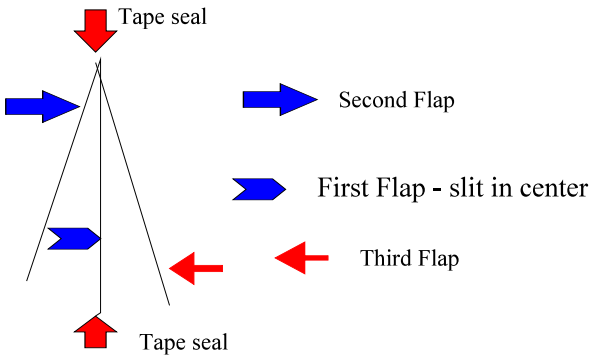
**Contractor/Supervisor** - A person who successfully completed an initial U.S. EPA and/or state-approved five-day AHERA-accreditation course and who has maintained that training through approved annual refresher training, and possesses current and valid AHERA-accreditation documentation as a AHERA-accredited Contractor/Supervisor

**Cal/OSHA 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.

**Curtained Doorway, Z-Flapped -** A device to allow ingress or egress from one room to another while permitting minimal air movement between spaces (such as the various rooms of the decontamination chamber). Each Curtained Doorway will consist of three sheets of poly. The first barrier will be a sheet of poly covering the entire passage and taped to the ceiling, walls, and floor. This sheet will be slit vertically in order for the workers to pass through it. Another sheet of poly will cover the first sheet but be taped only to the ceiling (or top of the first barrier) and down one wall. The third sheet of poly will be placed on the opposite side of the slit poly from the second sheet. The third sheet of poly will be attached in a similar manner as the second sheet except the wall attachment will be to the opposite wall. Each barrier must be weighted at the bottom in order to ensure that it will lay flat against the slit sheet opening should the negative pressure system fail. Please see diagram:




Other designs are permissible, if approved by the HMS, Inc. onsite project manager.

**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 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 not less than daily. All decontamination enclosure systems used for worker entry and exit shall be equipped with a shower. At no time shall z-flaps of Decontaminations Enclosure System chambers be taped, held or otherwise blocked open.

**DOP -** Dioctylphthalate particles which are normally used as an agent for testing the efficiency of HEPA filters.

**Demolition -** The wrecking or taking out of any load-supporting structural member, casework, items or surfaces of a facility together with any related handling operations and disposal.

**Dust or Debris -** Material visible to the HMS, Inc. Project Manager. Dust and debris may be contaminated with asbestos, and may affect the asbestos work practices, containment or clearance air samples required on this project, whether contaminated with asbestos or not.
**Encapsulant, Bridging/Penetrating -** A liquid material which can be applied to asbestos-containing

material to control the possible release of asbestos fibers from a material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

**Encapsulant, Lock-down -** A liquid product designed to mist the air within a contained area after the containment has passed visual clearance by the HMS, Inc. Project Manager. Lock-down encapsulant is designed to bind asbestos fibers together and to create a tacky surface causing non-visible asbestos fibers, settling out of the air, to adhere to containment poly.

**U.S. EPA -** U.S. Environmental Protection Agency

**Equipment Decontamination Enclosure System -** That portion of a decontamination enclosure system designed for controlled transfer of materials and equipment into or out of the work area, consisting of a clean room, washroom and holding area.

**Equipment Room -** A contaminated area or room which is part of the worker/equipment 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 item (pipe, duct, boiler, tank, reactor, turbine, furnace, etc.) at or in a facility, any portion of a facility or any structural member in or at a facility.

**Federal OSHA** or **OSHA -** Federal Occupational Safety and Health Administration.

**Fixed object -** A piece of equipment or furniture in the work area which cannot be removed, or will not be removed by Owner's decision, from the work area.

**Friable asbestos -** Asbestos-containing material which, when dry, can be crumbled to dust by hand pressure.

**Glovebag 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 glovebag assembly is a manufactured or fabricated device consisting of a glovebag (typically constructed of 6 mil transparent polyethylene or polyvinylchloride plastic), two inward projecting long sleeves, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process. Glovebags must meet the specification requirements for glovebags as listed in 8 CCR 1529. All workers who are permitted to use the glovebag technique must be highly trained, experienced and skilled in this method. All techniques and procedures employed by the contractor shall be approved by the HMS, Inc. Project Manager.

**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.

**HMS, Inc. Project Manager -** An individual, employed by (or sub contracted to) Hazard Management

Services, Inc., who is qualified by virtue of experience and education, designated as the Owner's representative and responsible for overseeing the asbestos abatement, and/or other activities.

**Holding Area -** A clean space where clean supplies and equipment are stored before being placed into containment. Also, a contaminated space, adjacent to a shower or equipment washing chamber, where dirty equipment or packaged waste is stored prior to removal from containment.

**Lock-down -** To mist the air and to wet surfaces with an agent designed to bind asbestos fibers together and to create a tacky surface causing non-visible asbestos fibers, settling out of the air, to adhere to containment poly.

**Magnehelic Gauge -** Instrument for measuring the static air-pressure differential across a barrier.

**Manometer -** See "Magnehelic gauge". This project requires at least one properly calibrated and fully functioning recording manometer.

**Mil** - An abbreviation for millimeter. Generally used when referring to the thickness of plastic (poly) sheeting used to contain the regulated area.

**Mini-Enclosures** - Mini-enclosures may be used where glovebag setups are not feasible. The use of them must be approved by the HMS, Inc. Project Manager. Mini-enclosures shall be constructed of six-mil polyethylene (attached with tape and/or glue to walls and floors) and shall be small enough for a maximum of two workers who can enter the enclosure one time, complete the abatement exercise, pass out the containerized debris and exit. The workers shall have available a change room contiguous to the work area where they can remove their coveralls prior to leaving the area.

**Monitoring -** May include:

a) Visual inspection for the presence of visible emissions; or
b) Air monitoring performed in accordance with accepted methods;
c) Collecting core samples of encapsulated or bridged materials.
d) Collecting other bulk samples during and following abatement.
e) Sampling substrata following abatement.
f) Inspection of abatement contractor's, and contractor's employees, work practices for compliance to these and other specifications and applicable regulations.

**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 Emission Standards for Hazardous Air Pollutants (40 CFR Part 61, Nov. 20, 1990)

**NIOSH -** The National Institute for Occupational Safety and Health

**Outside Air -** The air outside of containment. See also Ambient Air.

**Owner -** The Owner includes the individual or entity that owns the property and, unless otherwise stated, the Owner's authorized representatives, including the HMS, Inc. Project Manager, the Owner's Board of Trustees and the Owner's officers, employees, agents and representatives.

**PCM -** Phase contrast microscopy according to NIOSH Method 7400A.

**Poly -** Polyethylene sheeting.

**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.

**Prior experience -** Experience required of the contractor on asbestos projects of similar nature and scope to ensure capability of performing the asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.

**Regulated Area -** An area established by a contractor to demarcate areas where the contractor's employees may conduct Class 1, 2, or 3 work as described in 8 CCR 1529 or 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, or applicable regulations, regardless of airborne asbestos concentration levels.

**Regulations -** shall include all relevant federal, state, and local regulations including but not limited to:

a. U.S. Environmental Protection Agency Regulations for Asbestos (Title 40, Code of Federal Regulations, Part 61, Subparts A & B)
b. 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.
c. "Asbestos Hazard Emergency Response Act", U. S. Environmental Protection Agency, 40 CFR, Part 763. Final Rule and Notice.
d. Applicable local county Air Pollution Control Districts and Air Quality Management Districts or other local NESHAPs Enforcement.

**Removal -** The stripping of any asbestos-containing materials from surfaces, substrates or components of a facility. As per various regulations, the ground is considered a substrate.

**Regulated Area**- An area where asbestos-containing materials are going to be disturbed and may release asbestos fibers into the air and whose entrances have been posted. A regulated area is required for all Class I, II, or III work as described in 8 CCR 1529 or whenever the work may release asbestos in concentrations over the OSHA Permissible Exposure Limit (PEL) or Excursion Limit.

**Renovation -** Altering in any way one or more facility components.

**Scope of Work -** Job specific information and specifications used in combination with these Asbestos General
Requirements. If conflicts exist between the Scope of Work and these specifications, the stricter requirement will be enforced unless the conflict is specifically addressed in wirting in the Scope of Work for this project.

**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 -** The secured area outside of containment where clean equipment and supplies are stored. Waste must not be stored within the staging area unless placed within an additional lockable container or area approved by the HMS, Inc. Project Manager.

**Strip -** To take off friable asbestos materials from any part of a facility.

**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, in-progress and post job documents submitted by contractor to Owner's representative as indicated in General Requirements and Bidding Requirements.

**Surfactant -** A chemical wetting agent added to water to improve penetration.

**Temporary Enclosure System -** A system by where the regulated work area is isolated from the rest of the building or structure in a manner that prevents the escape of airborne asbestos fibers. Also see "Containment"

**TEM -** Transmission Electron Microscopy according to AHERA specifications for Level II analysis on all AHERA projects. Non-AHERA projects may employ other levels of TEM analysis.

**Visible Emissions -** Any emissions, whether containing particulate asbestos material or not, 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 loadout chamber system shall normally consist of three connected chambers adjacent to the work area. Each chamber shall be constructed with at least two layers of six-mil thick poly for the floors, walls, and ceiling. The chamber located closest to the work area is known as the dirty chamber, and in addition to the two layers of six-mil thick poly on the floor, shall also have a third layer of poly, four-mil or thicker, to be used as a removable drop layer. The drop layer is to be removed as needed but at least daily. The chamber located closest to the outside the work area is known as the clean chamber. See Section 15 for proper use of waste Load-out/Transfer System.

**Wet cleaning** - The process of eliminating asbestos contamination and visible dust and debris from building surfaces and objects by using cloths, mops, or other utensils which have been dampened with water and afterwards thoroughly decontaminating them or disposing of them as asbestos contaminated waste.

**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 or temporary enclosure is a work area that is isolated from the rest of the facility by the use of critical barriers and cleaning barriers, a decontamination system, and additional means of signs and barriers to reduce access by unauthorized persons. A contained work area is a work area which has been sealed, polyed, and equipped with a decontamination enclosure system. The work area includes all decontamination chambers, waste transfer system and the abatement area. A non-contained work area is an isolated or controlled-access work area which has not had poly installed nor been equipped with a decontamination enclosure system.

**Worker -** A person who successfully completed an initial U.S. EPA and/or state-approved four-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 asbestos worker.

## SECTION 2. NOTIFICATIONS, SUBMISSIONS, POSTINGS

### 2.1 Site Investigations

By submitting a bid to the primary contractor, and being listed by the primary contractor as the sub-contractor for asbestos related work, the asbestos abatement contractor acknowledges that they have investigated and satisfied themselves as to:

A) 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.

B) 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 District 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 District is not responsible for any conclusions or interpretations made by the asbestos abatement contractor on the basis of the information made available by the District.

### 2.2 Notification

Prior to commencement of work the Contractor shall send notices of the 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-start meeting.

For compliance with 40 CFR part 61.146 of Subpart M, send notice at least ten (10) working days prior to start of work to the all of the following appropriate agencies:

| | |
|---|---|
| EPA, Region 9<br>Asbestos Program Enforcement<br>75 Hawthorne Street<br>San Francisco, CA 94105 | Chief Compliance Division<br>California Air Resources Board<br>P.O. Box 2815<br>Sacramento, CA 95812<br>(for non-EPA delegated counties) |
| Local Air Pollution Control District (APCD) or Local Air Quality Management District (AQMD) | |

For compliance with 8 CCR 1529 and 8 CCR 5203, send written notice at least one day prior to start of work to:

State of California
Department of Occupational Safety and Health
District Office

These notices shall include, at a minimum, the name and address of the contractor, the name and address of the worksite, 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 his 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. The notices shall also include start and finish dates. Changes in start and completion dates shall be reported immediately to the proper agency. Use forms provided by agency whenever possible.

**2.31a Prestart Submittals - Contractor**

A. Contractor shall provide a copy of the notification for NESHAP compliance along with a receipt of fees paid.

B. Contractor shall provide a copy of the notification for Cal/OSHA compliance along with the fax confirmation receipt.

C. Contractor Notification to Local Hospital, Police, and Fire Department

D. Contractor shall provide a copy of their active CSLB License with Asbestos Certification.

E. Contractor shall provide a copy of their active Cal/OSHA (DOSH) registration.

F. 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.

G. Submit copies of insurance certificates which meet requirements as outlined below:

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.

Contractor shall submit proof of coverage for the asbestos abatement contractor and subcontractors under the Worker's Compensation insurance system of the State of California or other similar benefit acts.

Contractor shall submit a certificate of general liability insurance protecting against liability for bodily injury and property damage arising from the asbestos abatement contractor's activities under this contract.

Such certificate of insurance must contain the following provisions:

(a) The limit of liability shall not be less than $1,000,000.00 per occurrence for bodily injury and property damage liability combined.

(b) The Owner, Owner's Agents, and Hazard Management Services, Inc. (HMS, Inc.) must be named as additional insured, but only in respect to liability arising or resulting from activities under this contract.

(c) In the event of cancellation of the insurance policy, the Owner and HMS, Inc. shall be given thirty days advance written notice.

(d) The insurance certificate must state that the insurance includes liability coverage for asbestos abatement work.

H. Copy of Contractor's Bonding for Project

I. 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 bin location, or variances for scheduled work hours are required, this should be stated in writing and submitted to the Owner.

J. Submit Subcontractors information or statement that subcontractors will not be required or used during this project. This statement should also include that if it becomes necessary to use a subcontractor during this project that the subcontractor will not be allowed to perform work until all required documentation has been submitted for review by the Owner or HMS, Inc., and the Contractor receives written approval for use of the subcontractor on this project.

K. 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 rental equipment will be used on the project. The statement should also include that, if it becomes necessary to use rented equipment, written statements from each rental company will be provided to the Owner prior to its use, indicating the rental company's acknowledgment that the equipment is provided for and may be used in areas where airborne levels of asbestos may be present.

L. Submit emergency and non-emergency telephone numbers for the appropriate Police, Hospital, and Fire Departments. This list of numbers shall also include the name, pager or cell phone numbers of the onsite supervisor and his immediate company supervisor.

M. 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.

N. Submit written emergency procedures pertinent to the work to be performed and which can be implemented by site personnel if the need arises.

O. Submit detailed information on preparation of work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. Also 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.

P. 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.

Q. Submit to the Owner shop drawings, on projects where requested in the Scope of Work, for layout and construction of decontamination enclosure systems and barriers for isolation of the work area as detailed in this specification and required by applicable regulations.

R. Submit Material Safety Data Sheets (MSDS) 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.

S. 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 manufacturer's documentation pertaining to the capability of waste water filters to filter particles of 1.0 micron in size.

T. 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.

U. 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.

V. With the Owner's representative, inspect the premises wherein all abatement and abatement related activities will occur and submit a statement signed by both, agreeing on building and fixture condition prior to the commencement of work.

W. Submit a copy of the Contractor's Injury and Illness Prevention Program

X. Submit a copy of written Respiratory Protection Program

**2.31b Pre-Start Submittals-Contractor Waste Documentation**

Section 7, C. 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.

Section 7, D. 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.

**2.31c Pre-Start Submittals-Worker Certifications (Section 5, Letter B)**

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, action level, or the PEL 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 on 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 or quantitative 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 each of the following and other pre-abatement documents required above, unless exempted in the scope of work or the bidding requirements, prior to the start of abatement. This list is to be used a checklist only and specific requirements are outlined in Sections 2.31a, b, and c of the General Requirements.

**2.31a Checklist**

A. _____ Notification to Regional Air Resource Board, Regional EPA, or local APCD/AQMD

B. _____ Notification to CAL/OSHA (prior to start)

D. _____ Contractor notification to Local Police, Hospital, Fire Department

E. _____ State Contractor's license with asbestos certification

F. _____ Contractor Cal/OSHA Registration

G. _____ Notification of Prior Environmental Citations/LegalProceedings/ContractTermination

H. _____ Insurance Certificate

a) General liability

b) Asbestos liability certificate

c) Automobile Insurance

d) Workers' compensation insurance

e) Client and HMS, Inc. named as additional insured

H. _____ Payment or Performance Bonds (if required)

I. _____ City permits e.g. parking or dumpster (when required)

J. _____ Names of all Subcontractors, license numbers and copies of general liability insurance with a minimum coverage of $1,000,000.00. Client & HMS, Inc. named as additional insured.

K. _____ List of Rental Equipment and acknowledgment from Rental Company

L. _____ Emergency and non-emergency phone list

M. _____ Written Directions/Map to nearest Hospital

N. _____ Written emergency plan

O. _____ Written Work Plan

P. _____ Project Schedules

Q. _____ Contractor Map/Drawings for Containment Setup

R. _____ Material Safety Data Sheets

S. _____ Manufacturers' Equipment Specification Sheets

T. _____ Contractor Laboratory Accreditations

U. _____ Contractor OSHA Air Monitoring Statement

V. _____ Pre-Start Site Condition Statement

W. _____ Contractor Injury and Illness Prevention Program

X. _____ Contractor Written Respiratory Program

**2.31b Checklist**

_____ Name and number of transporters

_____ Name and EPA number of Waste Sites

**2.31c Checklist**

_____ Training records - AHERA (Supervisor and worker)*

_____ Respiratory fit tests for each employee*

_____ Medical records for each employee*

Note *No contractor worker will be allowed inside containment prior to verification of AHERA, respirator and medical documentation. This verification must either be onsite or faxed to HMS, Inc.'s office prior to entry.

**2.32 Prestart Submittals - Owner**

Owner shall provide to the Contractor prior to commencement of work:

a. Any available pre-abatement air sampling data to Contractor.

b. List of Owner's employees/agents who will or may require worksite access.

c. Data on equipment access protection and/or shutdown procedures.

**2.4 Submittals During the Work Process**

**The following documentation shall be submitted to the HMS, Inc. Project Manager:**

A. The contractor shall submit daily- a copy of the worker roster identifying all employees onsite and the hours worked.

B. The contractor shall submit daily - a copy of a one page summary of job progress. This summary must include a brief description of the work completed at the site(s), number of employees, and any issues that arose. This summary is in addition to the daily documentation required to be submitted by OSHA and AHERA regulations and other HMS, Inc. specifications.

C. The contractor shall submit daily - copies of work site entry/exit logbooks with information on worker and visitor access.

D. The contractor shall submit daily - copies of the air-differential manometer readings

E. The contractor shall submit results of air sampling data collected during the course of the abatement including OSHA compliance air monitoring results. Contractor shall submit sample results within 72 hours of collection of the samples for samples to be considered valid indicators of employee exposures within containment. Lack of valid exposure assessments may, at HMS, Inc. Project Manager's discretion, result in the contractor being required to raise worker personal protection levels.

F. Submit weekly copy of on-site safety meeting documentation. Each safety meeting must be signed by all employees working on the project for that week.

G. Proof of DOP or equivalent (Challenge) testing of HEPA-filtered units

H. Contractor shall submit copies of any Regulatory Agency Inspection/Enforcement Documents

I. Accident Report Forms

J. Other Contract Documents as required by Scope of Work

K. Construction Meeting Minutes

**2.41 Submittals During the Work Process-Waste Disposal (Section 7)**

A. The contractor shall submit copies of all transport manifests, Land Ban Certifications, trip tickets, weights and disposal receipts for all asbestos hazardous waste materials.

B. The contractor shall submit copies of all transport manifests, trip tickets, weights and disposal receipts for all asbestos non-hazardous waste materials.

**2.5 Clean-Room Area Postings**

Postings may be in a prominent area adjacent to the clean room, but must be visible to workers entering and exiting the containment.

List of persons authorized to enter restricted area. The list shall include, among others, the following names with addresses and phone numbers:

| | |
|---|---|
| Contractor | Testing Laboratory |
| Air-sampling Professional | Owner's representatives |
| Asbestos Project Manager | Any other designated by the Owner |
| Regulatory Agency Personnel | |

A copy of the daily entry/exit log book shall be maintained in the clean room area of the worker decontamination system and provided to the HMS, Inc. Project Manager weekly or as otherwise requested.

Telephone numbers, other than 911, of all emergency response personnel shall be prominently posted in the clean change area and equipment room. The locations of the nearest telephones shall be indicated on a map or diagram.

Written emergency procedures shall be posted in the clean room.

Written entry/exit procedures shall be posted in the clean room and equipment room. (See Section 9)

All of the contractor's personnel and area air sampling results shall be posted in the clean room area within 72 hours of collection, unless otherwise noted.

A copy of the CAL-OSHA and EPA or Local APCD notification shall be posted in the clean room area.

A CAL-OSHA Information poster and a CAL-OSHA Construction Site poster shall be posted in the clean room area.

Copies of Material Safety Data Sheets (MSDS) for all materials onsite shall be posted in the clean room area. Bag out/load out/waste transfer procedures must be listed in writing at the load out exit.

A copy of the contractor's written Respiratory Protection Program shall be posted in the clean room.

**2.6 Job Site Documents**

The following shall be available at each job site:

1. List of all AHERA-accredited workers and supervisors entering the regulated area.
2. An updated list of all contractor and subcontractor employees who have worked on this job.
3. All contract specifications, Scope of Work, addendums, change orders, etc.. Contractor competent person must sign a document stating he has full knowledge of the Scope of Work and contract specifications.
4. Written Injury and Illness Prevention Program.
5. Training records.
6. Medical records.
7. Written Respiratory Protection Program
8. Fit test records for all contractor employees

**2.7 Project Close-out Documentation and Submittals**

The Contractor shall generate a demolition "as built" drawing detailing all walls, floors, ceilings, mechanical items, plumbing, wiring and structural components which were removed, to what extent each of these items was removed (e.g. entire wall demolished from floor to ceiling), and in what areas. The contractor must provide this drawing to the Owner and HMS, Inc. at the conclusion of the interior asbestos abatement activities when required in the Scope of Work or requested by HMS, Inc. or Owner. Digital pictures of remaining conditions would be helpful, but are not required.

Unless submitted during the project, the Contractor shall submit the following post-job submittals to the Owner within thirty (30) days of the completion of asbestos abatement work.

_____ Copies of revised notifications to regulatory agencies.

_____ Receipts and weight tickets from the landfill operator acknowledging the Contractor's delivery of wastes and including dates, container types and quantities, and tarred weights of material delivered, and all appropriate signatures.

_____ 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. Include a signed cover sheet certifying that the copy is a complete copy of the log from the job.

_____ Copies of all accident reports submitted during the course of work.

_____ A copy of worker exposure monitoring results collected in compliance with Cal/OSHA regulations (Title 8 CCR, Section 1529) including daily/representative/full-shift/breathing-zone air samples and 30-minute excursion samples. Include a cover sheet signed by an authorized representative of the testing laboratory performing the work, indicating that the data is complete and accurate.

_____ If applicable, a copy of the asbestos waste documentation showing dates, times, manifest numbers, quantities of wastes, types of containers removed from the work area, the hauler, and the signature of the recorder.

_____ A Land Disposal Restrictions Notification and Certification.

_____ Completed Uniform Hazardous Waste and Non-Hazardous Wasteforms including information required for the Waste Shipment Record.

_____ A complete record of the air filtration devices used certifying DOP testing (if performed) and printed record, indicating continuous operation and documenting differential air pressure.

_____ All submittals required before, during, or after the project that have not been submitted must be received by HMS, Inc. prior to HMS, Inc. signing off on contractors final payment or pay retention release.

_____ Copies of Prevailing Wage Certification Records (unless project is not a prevailing wage project)

**SECTION 3. SITE SECURITY**

The regulated area shall be restricted to authorized, trained personnel wearing appropriate personal protective equipment.

If required in the Scope of Work and whenever an entire building is placed under containment, the work area(s) under construction must be isolated from the remainder of the property and/or adjacent properties with temporary chain link fencing. This fencing does not eliminate or reduce plywood barrier requirements for any portion of containment that exists on exteriors of buildings. Temporary fencing must be supported at least once every section of fencing by concrete block or equivalent.

Unless exempted in the Scope of Work any portion of containment on the exterior of the buildings must be protected by a burglar resistant, lockable plywood structure. This structure must have a roof and be

at least 8 feet tall. This plywood barrier must be solid plywood and be constructed in a manner sufficient to withstand expected weather conditions (i.e. wind, rain, etc.). A soffit overhang may be used for the roof of this structure, barrier walls must extend completely up to soffit overhang ceiling.

Entry into the work area by unauthorized individuals shall be reported immediately to the Owner by the Contractor.

A log book shall be maintained in the clean room area of the worker decontamination system. Anyone who enters the work areas must record name, affiliation, time in, and time out for each entry. A copy of the daily log shall be provided to the HMS, Inc. Project Manager daily or as otherwise requested.

Access to the work area shall be through a worker decontamination system. All other means of access (doors, windows, hallways, etc.) shall be blocked or locked so as to prevent entry to or exit from the work area. The only exceptions for this rule are the waste loadout 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. These 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, 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 asbestos containing debris, hazardous or not, 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 bins.

All Owner policies and procedures regarding site security and safety shall be strictly adhered to by the Contractor.

Keys and/or lock combinations to all lockable enclosures and waste bins must be provided to the HMS, Inc. Project Manager prior to the start of abatement.

## SECTION 4. EMERGENCY PLANNING

Emergency planning and procedures shall be developed by the Contractor prior to abatement initiation and agreed to by Contractor and Owner.

Emergency procedures shall be established and presented to all employees and the HMS, Inc. Project Manager prior to the beginning of any work. A written emergency plan must be posted.

Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities, work schedule and layout of work area, particularly barriers that may affect response capabilities. Emergency planning shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, trips and falls, and heat related injury. A copy of the written Injury and Illness Prevention Program shall be on the work site.

Employees shall be trained in evacuation procedures in the event of workplace emergencies. Telephone numbers of all emergency response personnel shall 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. At least one fire extinguisher shall be present outside of the containment and at least one fire extinguisher shall be present inside containment. Additional extinguishers shall be distributed according to Cal/OSHA requirements or as identified in the Scope of Work.

An emergency blast horn shall be placed inside of any containment comprising more than a single building space for emergency evacuation in the event of a fire or other emergency.

If required in the Scope of Work, a means of radio communication shall be established between inside and outside of containment whenever a containment has a section(s) not directly visible from a clear-sight view window. This requirement may be met through walkie talkies or by wired communication systems. HMS, Inc. project monitor is to be given a communication device tied into communication system used by the contractors crew.

The contractor shall clearly mark emergency egress routes in brightly colored spray paint, tape, or equivalent, within the containment area. When required by the specification, or deemed necessary by the HMS, Inc. Project Manager, the contractor shall station flashlights throughout the work area to be used in the advent of an electrical power outage. Tools that can be used to cut containment poly must be placed at each emergency egress location.

Emergency exit signs, and arrows painted, taped or otherwise marked shall be located approximately three feet from the floor level. This will make signs visible for standing workers as well as workers required to crawl to emergency egress location.

In the event of a power and/or water interruption all abatement work, other than cleanup of debris on the ground, is to stop. Work disturbing asbestos cannot continue until the power and/or water is restored or the Project Manager authorizes emergency procedures

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.

In the case of fire, or other life threatening situations, all decontamination requirements are null and void. Immediate preservation of life takes precedence over decontamination requirements.

If emergency personnel (fire, police, paramedics, etc.) are called to the project site, they must be informed of the fact that the project is an asbestos abatement project and whether containment has been established and/or breeched.

## SECTION 5. PRE-START MEETING (See also Section 2)

The successful Bidder, his on-site supervisory personnel, and Air Sampling Professional (if applicable), representatives of the Owner, Owner's Asbestos Project Manager, and other individuals as necessary shall be present at a pre-start meeting **TIME AND PLACE AS NOTED IN THE SCOPE OF WORK OR TO BE DETERMINED**.

Responsibility for notification of building occupants regarding impending activity shall be determined at this meeting.

At this meeting the Contractor shall provide all required submittals, as indicated in Section 2, Part 2.31a, b, and c.

The Contractor's supervisory personnel must be given a complete copy of the Scope of Work, and attached abatement specifications (including these Asbestos General Requirements), and must be familiar with them prior to the pre-start meeting. Delays caused by an onsite contractor foreman not

being familiar with the requirements of these specifications will not extend the Contractor's completion date.

In addition, contractor shall be prepared to provide detailed information on preparation of work area, personal protective equipment, employee experience, training and assigned responsibilities during the project. Contractor must also be prepared to discuss 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. A sequence of work and performance schedule, procedures for dealing with heat stress and emergency procedures shall also be submitted.

If applicable, a detailed work-area-by-work-area schedule must be submitted at this time. The schedule shall have, at 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.

## SECTION 6. MATERIALS AND EQUIPMENT

### 6.1 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, 4-mil thick for walls and 6-mil 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, fire-rated poly. This includes all poly used for decon setups whether or not they are erected inside of the building.

Polyethylene 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 HMS, Inc. Project Manager determines one is needed.

Disposal bags shall be of 6-mil polyethylene with labels required by OSHA, DOT, Department of 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 dumpsite.

Stick-on labels as per DOHS 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 polyoxethylene ester or equivalent, mixed and used according to the manufacturer's directions.

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 of this specification.

All HEPA filtration equipment must be tested with DOP or an equivalent testing agent (see Section 12).

The contractor will provide adequate number of respirators for the work force. These respirators will include, when specified:

a. Full face piece supplied air respirators with HEPA-filtered disconnects operated in positive pressure or pressure demand mode.
b. Full face piece, tight-fitting, powered air-purifying respirators with HEPA-filters,
c. 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.

Contractor shall provide full-body disposable protective clothing, including head, body, and foot coverings, such as Tyvek, or equivalent, to all workers and authorized visitors in sizes adequate to accommodate movement without tearing. No street clothes, unless excepted by Scope of Work or other portions of this specification are allowed to be worn under disposable protective clothing.

The Contractor shall provide additional safety equipment (e.g., hard hats, eye protection, safety shoes, disposable PVC gloves), as necessary to all workers and authorized visitors.

Non-skid footwear shall be provided to all abatement workers.

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. Only fiberglass ladders shall be used within the work area. Wooden ladders and wooden handled tools shall not be allowed within the work area.

Rubber dustpans and rubber squeegees shall be provided for cleanup.

A sufficient supply of HEPA-filtered vacuum systems shall be available.

The HMS, Inc. Project Manager 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.

All product data sheets and all Material Safety Data sheets (MSDS) shall be submitted for all products and materials prior to their use on the job site.

All contractor equipment and supplies must arrive on site clean and dust free. Equipment must be inspected and accepted by HMS, Inc. Project Manager 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. Chipped and/or rusted equipment will not be accepted even if it is to be used outside of containment. 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 decision of the Owner, HMS, Inc. Project Manager or the Owner's representative on all equipment and supplies shall be final.

**6.2 Rental Equipment and Supplies**

Any equipment rented and delivered to the site for the purpose of conducting 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager must be informed 24 hours prior to the delivery of any rental equipment.

The decision of the Owner, HMS, Inc. Project Manager or the Owner's representative on all rental equipment and supplies shall be final.

**SECTION 7. 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 including pants and shirts. No21hing suits or disposable coveralls are allowed to be worn to use the sanitary facilities.

At no-time will workers be allowed to exit the containment area, once abatement has begun disturbing asbestos, without showering prior to entering the clean chamber of the decon. (Exception to this may be made, at HMS, Inc. project manager's discretion, for Project Manager and Contractor's supervisor for conducting a clearance visual during which the HMS, Inc. Project Manager may allow street clothes to be worn under disposable overalls).

At no time shall workers exit the clean room/changing area wearing anything other than street clothes, including pants and shirt.

The Owner shall provide water for construction purposes, unless stated otherwise in the Scope of Work. Contractor shall connect to existing Owner system.

The Owner shall provide the electrical source. Contractor is responsible for all connections and disconnection of electrical power. All electrical power supplied to the containment area must be ground fault interrupter protected. Loss of power due to contractor activities will require contractor to supply electrical power at his own expense.

The Owner or its representative shall specify the waste water discharge location and location of waste bins. The owner, when applicable, shall specify acceptable routes of travel.

The Contractor shall be required to place footing materials of sufficient thickness, strength, and size under the casters, footings, and/or runners of waste bin(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 bin. Damaged property shall be repaired to equal or better condition than was present prior to the activity causing the damage. This may be amended in scope of work for this project.

The Owner shall specify on-site parking areas, if available, and access to the site.

**SECTION 8. 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 worksite.

The HMS, Inc. Project Manager, his or her onsite representative, or the Owner or their representative may deny access to the regulated area to anyone who, in the final judgement of the HMS, Inc. Project Manager, 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 HMS, Inc. Project Manner 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 HMS, Inc. Project Manager 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 be in compliance 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 conducting 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 off of furniture, equipment and floors, and the set-up of contaminated work areas.

The judgement of the HMS, Inc. Project Manager 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 conducting 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 HMS, Inc. Project Manager, the airborne asbestos levels are expected to exceed one fiber per cubic centimeter of air (1 f/cc).

After work has begun, if the Contractor wishes to lower respiratory protection requirements, such as for glovebag or other work, he or she must demonstrate to the HMS, Inc. Project Manager that personal air sampling results from that project prove that airborne fibers levels are below the Cal/OSHA Permissible Exposure Limit. The Project Manager 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 Project Manager will have final authority regarding whether or not the respiratory protection may be reduced below the need for powered-air purifying respirators.

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 conducting 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 HMS, Inc. Project Manager 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 Project Manager 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 Project Manager will have final authority regarding whether or not the respiratory protection may be reduced or eliminated. For example, the HMS, Inc. Project Manager 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 HMS, Inc. Project Manager 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 HMS, Inc. indicate higher than expected levels, the Project Manager is authorized to increase the level of required respiratory protection.

The HMS, Inc. Project Manager 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager.

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-mask air purifying respirator equipped with high efficiency particulate air (HEPA) filter - P-100 | 10 |
| Full-face air purifying respirator equipped with HEPA filter - P-100 | 10 |
| Half or full-face, powered air purifying respirators equipped with HEPA filter - P-100 | 1,000 |
| Type C continuous flow supplied air | 1,000 |
| Full facepiece, supplied air respirator operated in pressure demand mode | 1,000 |
| Full facepiece, supplied air respirator operated in pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus | 10,000 |

Workers shall be provided, as a minimum, with personally issued and marked respirators equipped with high efficiency particulate air (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 estimated to be greater than 0.01 f/cc inside their respirator 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 HMS, Inc. Project Manager weekly.

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 HMS, Inc. Project Manager 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.

## SECTION 9. 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.

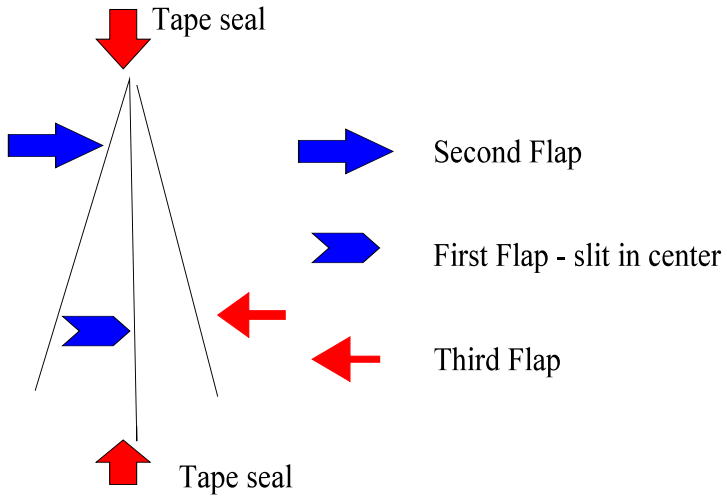
Hard hats, protective eye-wear, proper protective gloves, rubber boots and/or other footwear shall be provided by the Contractor as required for workers and authorized visitors. Safety shoes may be required for some activities.

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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager, 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 10. WORKER DECONTAMINATION ENCLOSURE SYSTEMS (WASTE TRANSFER DECON)




Wor ker 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. . All decontamination units shall have, at least, two layers of 6-mil polyethylene sheeting.

Unless stated otherwise in the Scope of Work, all decontamination units, pressure differential units, and other portions of containment outside the building shall be covered with a 2"x 4" wood studs and 1/2" 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 HMS, Inc. Project Manager and mounted through a solid surface, such as plywood. Entry and exit from all airlocks and decontamination enclosure system chambers shall be through doorways designed to restrict air movement between chambers when not in use.

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 plastic at the corners of this floor is to be fitted to the sides of the chamber by folding plastic and taping, as opposed to cutting away excess poly and taping seams. In addition to this four inch lip of poly the shower chamber shall 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.The dirty side shall have an extra layer of 6-mil polyethylene sheeting on the floor as a "drop cloth" and it shall be replaced at least daily.

The clean room shall be sized and equipped to adequately accommodate the work crew and personal protection equipment. Minimum size of clean and dirty chambers shall be three feet by three feet, minimum size may be increased by requirements in the Scope of Work. 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), nor as office space.
Shower room shall contain one or more operable showers as necessary to adequately accommodate workers, minimum of one shower for every ten (or portion there of) 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 decon 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 1.0 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 7' tall.

Abatement work will be stopped if decon 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 11. 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.

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 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. All clothing items, including underwear or hair coverings must be removed and disposed of prior to entering the shower.

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. Contaminated footwear shall remain within the equipment room for the duration of the project. Cleaned footwear may be removed from containment, but must be approved by HMS, Inc. Project Manager.

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 12. DIFFERENTIAL AIR PRESSURE SYSTEMS (See also Section 13)

### 12.1 Negative Pressure Requirements

Negative pressure shall be maintained at -0.04" water differential at all times during abatement activities, including entry/exit and bag out procedures. Contractor shall assign crew members to determine cause of loss of pressure any time containment's negative pressure drops below -0.04" 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 -0.04" water differential or better.

In the event that containment cannot be brought up to -0.04" 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 HMS, Inc. project manager agrees that contractor has tried all possible remedies, HMS, Inc. project manager may grant reduction in negative pressure requirement. HMS, Inc. project manager 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.

### 12.2 Challenge Testing (DOP or equivalent

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 HMS, Inc., on-site and prior to use. All vacuums and pressure differential units shall meet A NSI Z9.2, using an appropriate testing agent. Documentation of these tests shall be provided to the HMS, Inc. Project Manager 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 HMS, Inc. 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 draft.

**12.3 Differential Pressure Recording Instruments**

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 HMS, Inc. Project Manager. 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager 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.

**12.4 Differential Pressure System**

Exhaust air shall be vented only to the exterior of the building at locations approved by the Owner unless otherwise noted or directed in the Scope of Work or by arrangement with the HMS, Inc. Project Manager. Such outlets shall not be near or adjacent to other building intake vents or louvers or at entrances to building. Openings made in the enclosure system to accommodate these units shall be made air-tight with tape and/or caulking as needed. They shall NOT be exhausted into occupied areas of the building. Twelve inch (12") extension ducting shall be used to reach from the work area to the outside when required. Careful installation by the contractor, air monitoring by HMS, Inc. and daily inspections by the contractor shall be done to ensure that the ducting does not release fibers into uncontaminated building areas.

The work area shall have a differential air pressure of -0.04 inches water differential 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 flex ducting shall be used within the containment area for exhausting of filtered air. Contractor may not construct ducting using poly or other materials.

All interior of containment air pressure differential units and flex ducting 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.
Flex ducting 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 13. EXECUTION

### 13.1 Execution

Contractor and Owner 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.

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 oe deemed necessary by the HMS, Inc. Project Manager.  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 HMS, Inc. Project Manage 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager. 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 HMS, Inc. Project Manager 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 HMS, Inc.

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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager will approve quantity and placement of these inspection windows. HMS, Inc. Project Manager has the right to require more clear sight windows or rquire 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 HMS, Inc. Project Manager 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 -0.040 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 ducting 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 ducting does not release fibers into uncontaminated building areas.

All flex ducting, protected by poly during abatement or not, pre-filters and intermediate filters shall be manifested and discarded as friable, hazardous asbestos-containing materials. A flex 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:

a. 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 HMS, Inc. Project Manager, a written explanation of how and why the containment is to be altered must be submitted to the HMS, Inc. Project Manager for approval.
b. Pressure-differential systems are functioning according to an acceptable design.
c. All pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to the Owner or its representative.
d. All equipment for abatement, clean-up and disposal is on hand.
e. All worker training (and AHERA certification) is completed and documented.
f. 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 project manager from outside the containment. This window shall measure approximately 1' wide by 2' high. It shall be installed at a location approved by the HMS, Inc. Project Manager. It is recognized that viewing ports are not possible in all locations.
g. All pressure-differential units and vacuums have received and passed onsite DOP testing.
h. Contractor has at least one competent person at each site in which work is taking place.
i. All necessary documents and information have been posted or are on the work site. See Section 2.

## 13.2 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. Decon 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:

- Generator must not violate any local noise ordinances nor disturb adjacent building occupants.
- 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.

## 13.3 Work Schedule

A detailed work area by work area schedule must be submitted at the pre-start meeting. The schedule shall have, at 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.

Contractor's request to change this schedule must be submitted to HMS, Inc. in writing at least 48 hours prior to the proposed addition, deletion or change in hours of a work shift. This would include working more than one shift per day, working extra days in the week, changing work hours or work days, etc. If 48 hours notice is not given, the proposed work shift may be canceled by HMS, Inc. Project Manager. The Owner and/or HMS, Inc. Project Manager 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 onsite without notifying HMS, Inc. Project Manager 24 hours in advance, the contractor becomes responsible for all HMS, Inc. Project Manager travel fees, onsite time fees, and other associated project management fees for that day.

## SECTION 14. REMOVAL PROCEDURES

Contractor shall 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 shall be removed in manageable sections. Removed material should be containerized immediately (as soon as removed). 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 any work stoppage, such as for breaks, lunch, end of each shift, or project shut down (voluntary or not).

Material removed from building structures or components shall not be dropped or thrown onto unprotected floors at any time. Floors shall be covered with poly regardless if they are being removed after ceiling or walls. Material should be removed as intact sections or components whenever possible and carefully lowered to the floor.

Containers (6-mil polyethylene 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.

Drums shall be used to dispose of asbestos-containing waste with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting). Waste must be double bagged and goose-necked within drums.

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. Unprotected flooring surfaces shall not be encapsulated unless otherwise noted in the Scope of Work or indicated by the HMS, Inc. Project Manager.

After asbestos-containing materials have been removed from floor surfaces. These floor surfaces shall be washed with a TSP solution, or similar detergent acceptable to the Client, follow-up flooring contractor, and HMS, Inc, Project Manager, prior to clearance air tests.

## SECTION 15. 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager 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 16. CLEAN-UP PROCEDURE AND VISUAL CLEARANCE CRITERIA

### 16.1 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 HMS, Inc. 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 HMS, Inc. Project Manager and client.

**16.2 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.

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 HMS, Inc. Project Manager 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.

When required, clearance air sampling shall be performed following the requirements specified in Section 17 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 school 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.

The HMS, Inc. Project Manager 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.

**HMS, Inc. Project Manager 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 HMS, Inc. Project Manager. HMS, Inc. may supply additional personnel for inspection in order both to speed the inspection and to more thoroughly inspected the containment areas.

Owner, contractor and HMS, Inc. Project Manager shall jointly review the work area and make a damage assessment, after clearance air samples have passed and containment has been torn down.

## SECTION 17. CLEARANCE AIR MONITORING

Following the completion of clean-up operations, the contractor shall notify the HMS, Inc. Project Manager 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 HMS, Inc. Project Manager 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 (ie floor tile only projects).

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 HMS, Inc. Project Manager 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 Project Manager'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 HMS, Inc. personnel to collected the air samples and the cost of laboratory analysis.

**Roof Removal:** No clearance air monitoring required. Only a visual inspection of the roof for roofing debris will be provided.

**Tar-like Pipe Wrap Removal:** This non-friable material will only be removed by cutting the clean ends of the pipe it is insulating. No clearance air monitoring required.

**TSI Removal:** When removal is less than three linear feet within a single glovebag (or similar) containment, no clearance air monitoring will be required.

Regardless of the method used, when removal exceeds three linear feet within a single containment clearance air monitoring will be performed prior to the removal of the containment barriers.

**Drywall Removal:** Regardless of the asbestos content, when the quantity of drywall removed exceeds 3 square feet, clearance air monitoring will be performed prior to the removal of the containment barriers.

**VFT & Mastic Removal:** When the quantity removed exceeds 3 square feet, clearance air monitoring will be performed prior to the removal of the containment barriers.

## SECTION 18. MONITORING

Owner reserves the right to perform air and performance (contractor work practices, house keeping, record keeping, etc.) monitoring at any time.

Contractor shall conduct personal air monitoring in accord with OSHA regulations. Results shall be made available to the HMS, Inc. Project Manager within 72 hours of collection. Hard copies of these results shall be supplied to HMS, Inc. Project Manager within 7 days of collection. Failure to supply these sample results in the specified time may cause work to be stopped until all delinquent results have been submitted. Loss of contractor work time because of non compliance of the provisions of this paragraph will not extend the date for work completion.

Owner 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 the Scope of Work, General Specifications, General Requirements, or other Project Specifications.

In areas where soil contamination may be present, soil samples must meet specified criteria in Scope of Work prior to clearance air samples collection.

Owner, or HMS, Inc. Project Manager, 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 19. DISPOSAL PROCEDURES

### 19.1 Disposal Procedures

Waste transport and disposal personnel must wear at least half mask HEPA-cartridge type respirators when handling intact sealed bags.

Disposal bags shall be of 6-mil polyethylene, pre-printed with labels as required by California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) regulations.

Disposal drums shall be plastic, metal or fiber board with locking ring tops. If heavy duty card board boxes are allowed in the Scope of Work, they may replace the barrels. Cardboard boxes must be sturdy enough not to be deformed or compromised by the weight of the materials disposed within them.

All containers, including bags and barrels or boxes must be labels the same as the ACM waste disposal bags.

All waste shall be double bagged in 6-mil polyethylene bags and goose-necked. These bags will then be placed into disposal drums as described above.

Contractor shall provide stick-on labels for disposal containers that meet the Cal/OSHA, NESHAPS, and DTSC requirements for hazardous and non-hazardous waste container labeling.

All waste bags shall have visibly damp materials but shall not contain loose water. In the event loose water is discovered within a waste bag, it shall be absorbed with kitty litter, saw dust or similar product prior to the bag being sealed.

All asbestos waste, hazardous or not, shall be manifested. Non-hazardous waste shall be manifested on a non-hazardous waste manifest.

All waste containers (barrels or boxes) shall be sealed in a manner that allows them to be opened for inspection of sealed bags within by HMS Project Manager, Regulatory personnel and Dumpsite personnel.

Waste placed into boxes or barrels at the project site must be disposed of within the same boxes and barrels at the dumpsite. Removal of waste from these boxes and barrels is not allowed. As the work progresses, to prevent exceeding available storage capacity onsite, 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 NESHAPS and applicable State and Local guidelines and regulations, including the California State Environmental Protection Agency, Toxic Substances Control Division regulations.
Transport vehicles shall be marked with the sign prescribed by NESHAPS regulations 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 the Owner's 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 Owner's agent.

**19.2 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 dumpster, which has been lined with 6-mil polyethylene (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-facepiece, 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 onsite which contain other hazardous waste, or hazardous waste from another owner. Waste from multiple sites of the same 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 dumpster 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 dumpster 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.

Dumpster truck or storage bin must be locked at all times except when being filled.

It is the contractor's responsibility to see that all dumpsters, trucks, and storage bins arrive onsite completely free from debris.

The contractor shall provide a weight receipt that identifies the net weight of the material being discarded.

**19.3 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, barrels 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-facepiece, 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. Polyethylene sheeting shall be removed and discarded, along with contaminated cleaning materials and protective clothing, in bags or drums at the disposal site.

## SECTION 20. 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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager shall make the determination as to what which requirements and/or specifications are more stringent.

### 20.1 General Repair of Damaged Thermal System Insulation (TSI) Procedures

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. Contractor shall establish a regulated area according ti the requirements of 8 CCR1529 and as enhanced by this specification and the Scope of Work, including but not limited to the posting of the area and allowing on authorized personnel into the work area.

2. 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.

3. Half-masks and disposable suits (at a minimum) shall be used during this work.

4. 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.

5. 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.

6. 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.

7. It will be necessary to remove small sections of other insulation material, such as fiberglass, if debris from the damaged pipewrap has contaminated it.

8 If appropriate, contractor shall HEPA-vacuuming the damaged section will collect all loose, hanging, friable insulation material prior to any further repair work.

9 Very small cracks, holes, nicks, and cuts can be repaired with only joint compound or with a single layer of wettable cloth and appropriate bridging encapsulant. Larger sections of damaged pipewrap, particularly where pipe hangers or metal channel have damaged the insulation, will require at least two layers of wettable cloth.

10. Where the pipewrap cannot be removed completely from penetrations in the walls, floors, or

ceilings, the pipewrap shall be removed at least one inch 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.

11. All of the Contractor's materials, including poly sheeting, tape, joint compound, etc. shall be removed at the completion of the work performed.

**20.2 Glovebag Technique Requirements**

Where the glovebag technique is specified for removal of Thermal System Insulation (TSI), or in those areas where the Contractor opts to use glovebags, all of the following conditions must be met:

1. The Contractor shall develop a regulated area that meets the requirements of 8 CCR 1529 regarding posting and limited access.

2. The Contractor shall follow the procedures recommended by the manufacturer of the glovebags, and the specifications required by Federal OSHA and Cal/OSHA regulations

3. All critical openings within the regulated area shall be sealed prior to set up of the containment.

4. At least one layer of 6 mil poly must be used to contain the abatement area.

5. 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.

6. 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.

7. Negative pressure shall be established and a circular graph recording manometer shall be attached to the containment per Section 13.

8. A HEPA-filtered vacuum shall be in the immediate area for use in conjunction with the bags or in case of a spill.

9. Glovebags may not be used on surfaces where temperatures exceed 150 degrees Fahrenheit.

10. Glovebags may be used only once, and may not be moved or slid for removal of a second section of TSI.

11. At least two persons shall perform Class I glovebag removal as defined by Federal and Cal/OSHA.

12. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in two layers of 6 mil poly sheeting or otherwise rendered intact.

13. 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.

14. The Contractor shall apply a sufficient volume of amended water to all pipewrap scheduled for removal while it is enclosed in the glovebag.

15. A sliding valve or other device shall separate the waste bag from the hose to ensure no exposure when the waste bag is disconnected.

16. Prior to placement in the disposal bag, glovebags shall be collapsed by removing air within them using a HEPA-vacuum.

17. Upon detachment, the glovebag must be immediately placed into at least two 6 mil thick disposal bags. The disposal bags must be sealed using the "gooseneck" sealing technique.

18. Where pipes enter walls, floors, or ceilings which are not within the scope of the project, the pipewrap shall be removed at least 1" into the structure and the pipewrap end must be sealed with bridging encapsulant and/or wettable cloth.

19. 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 Glovebag 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.

20. 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.

21. 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.

**20.3 Mini-Cube Enclosure Requirements**

1. For the purposes of these specifications, "mini-cube 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 glovebag technique, only one layer of 6 mil poly sheeting is required for construction of the mini-enclosure. All mini-enclosures, mini-cubes, etc. must have a view port that allows the HMS, Inc. Project Manager to view the activities going on inside the regulated area. The placement, number, and size of the view port(s) must be acceptable to the HMS, Inc. Project Manager.

3. At least two chambers shall be present, separated by flapped poly sheeting doors. The first chamber upon entrance will be called the "clean" chamber, while the second chamber will be called the "dirty" chamber.

4. 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 of the chamber with poly and tape from the inside.

5. Dirty chamber must be sealed around work area in a fashion that creates an air-tight seal without causing damage to floor, walls, ceilings or other materials. This may be achieved by use of a pliable material, such as non-porous foam rubber, or other methods approved by the HMS, Inc. project

manager. A tight seal must be maintained without damage to the remaining materials (this may be difficult if tape is used).

6. 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.

7. A HEPA vacuum shall be used to establish "negative pressure" or airflow into the enclosure. This shall be verified by using ventilation smoke tubes.

8. The following equipment and materials, at a minimum, must be present inside the mini-enclosure "dirty" chamber:

   6 mil poly bag with clean rags for cleaning.

   Amended water in a Hudson-like sprayer for the rags.

   Empty bag for disposal of items.

   Flashlights or drop light as appropriate.

   Personal Protective Equipment including extra suits incase of multiple entry/exits

   Amended water in a properly labeled Hudson Sprayer

   Daily change of 6 mil poly sheeting drop layer.

   Other tools needed to perform task.

9. The following equipment and materials, at a minimum, must be present inside of the mini-enclosure "clean" chamber:

   Clean potable water in a Hudson-like sprayer which is labeled "Clean Potable Water Only". A new container must be designed for potable water only. No container used previously to hold liquids will be allowed. No open containers will be allowed.

   Clean disposable shower or hand towels for drying hands, arms, and face.

   6 mil poly bag for disposal of towels and other items.

   Any other tools the Contractor requires, such as tape, screwdrivers, etc.

10. The work area must be delineated with the proper barrier tape and the outside of the poly-flapped entry to the mini-cube must be posted with OSHA required warning signs for a regulated area.

11. 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.

12. 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 decontamination

requirements in related sections of this specification.

13. 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 visual inspection by Owner's agent/site representative will be required prior to removal of the mini-enclosure. Mini-enclosure shall be constructed in a fashion that will stay in place, remain intact and under negative pressure for numerous days while awaiting clearance air sample results.

## 20.4 Roofing Abatement Requirements

### General Requirements

1. Except as amended here and in the Scope of Work, all other Sections of this Exhibit 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 reroofed or covered, and secured from the weather.

   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 onsite project manager. This section may be amended in other sections of this specification for this project.

   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 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 reroofed, secured, or properly protected from weather in case the forecast changes unexpectedly or without warning.

3. All work hours at the site shall be determined by the Owner or as defined in other sections of this Exhibit. Unless otherwise stated, the buildings will be reoccupied each morning Monday through Friday.

4. 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 Exhibit.

5. 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.

6. 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.

7. 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 and for fall protection for those working near the perimeter of the roof.

8. 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**

9. 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.

10. 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.

11. 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 the Scope of Work.

12. The Contractor is responsible for damage to the roofing substrate, and will be responsible for repair or replacement if damaged.

13. 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 the Scope of Work. 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 the areas affected to industry standards using non-asbestos materials.

14. 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 paint or tar coating on conduit, roof jacks, heating, ventilation, and air conditioning (HVAC) equipment, flashings, 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 the Scope of Work for this project.

15. 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, ducting, 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.

16. 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 the Owner's representative.

17. The Contractor is responsible for obtaining all necessary permits to perform this work, including any local permits for work in the evening/night hours.

18. 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, District'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 District'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 District 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**

19. 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.

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.

**General Roof Removal Instructions and Requirements**

20. Removal of non-friable asbestos-containing roofing is designated as Class II work. Half-masks and disposable coveralls shall be used at a minimum by all workers, at all times, when within the regulated area.

21. 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.

22. All roofing material shall be removed in an intact state to the extent feasible.

23. All roofing is to be removed wet by an amended water solution or encapsulant as necessary.

24. 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.

**Pre-Abatement Preparation Requirements**

25. 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 and cover an area extending out 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 Bins and Waste Bin Preparations**

26. The Contractor is responsible for inspecting all waste bins delivered to the job site for load worthiness. The Owner's agent/site representative reserves the right to refuse any waste bin 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.

27. The Contractor shall be required to place footing materials of sufficient thickness, strength, and size under the casters, footings, and/or runners of waste bin(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 bin. 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 the Scope of Work for this project.

28. 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 trucks, bins or dumpsters from the roof without the protection of a dust tight chute or other means acceptable to the HMS, Inc. Project Manager.

**Posting and Label Requirements for:**

**Regulated Area Entry Points and Waste Bin Perimeters**

29. 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 bin(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**
**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 areas and waste bin(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**

30. 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**
**AVOID CREATING DUST**
**CANCER AND LUNG DISEASE HAZARD**

**General Requirements for Creating Roof Penetrations**

31. All roofing penetration cuts (if any) shall be at the direction of the primary contractors' Job Foreman, and coordinated with Owner's agent/site representative as to the time of work. Any equipment to be used for the purposes of cutting, grinding, or sanding must meet or exceed all Cal/OSHA requirements regarding HEPA filtration and wetting/misting. Any equipment rented for the purpose of conducting asbestos 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 related work. This documentation will be submitted to Owner's agent/site representative prior to the equipment being used on the job site.

The penetration area shall be surrounded by a 10 foot wide section of at least 4 mil poly. This poly will help in the cleanup of small roofing material particles which may otherwise be mixed onto the surface of surrounding roof material. If the penetration is within 10 feet of the edge of the roof, poly shall be placed on the ground (or roof) directly below the work area. The Contractor shall secure the poly to the ground using tape, weights, or other means to secure the poly from wind and becoming a trip hazard.

**Waste Disposal and Documentation Requirements**

31. 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 dumpsters lined with a single layer of 6 mil poly sheeting. The Contractor shall completely enclose all roofing waste material commonly known as "burrito wrap" in the dumpster using 6 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 6 mil poly sheeting, the top of the dumpster shall be completely enclosed with a tarp which is secured to the vehicle for transport or storage onsite if left overnight. The type of material for the tarp shall meet all requirements for transport of hazardous materials.

32. 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.

**20.5 Vinyl Asbestos Floor Tile (VFT) Removal Requirements**

Contractor shall conduct VFT and/or mastic removal within a regulated area as defined by 8 CCR 1529.

1. The doors, windows, and penetrations into the rooms shall be sealed with polyethylene. All ventilation systems shall be locked-out and sealed as critical barriers. An attached three stage decon with operational shower is required. The Scope of Work may require more chambers depending upon the project size.

2. Baseboards shall be removed if necessary to access all VFT. If baseboard mastic contains asbestos, baseboards are not to be disturbed prior to start of abatement.

3. Half-mask respirators, rubber boots, gloves, and disposable coveralls are to be used as a minimum for worker protection.

4. The VFT's must be double bagged in 6 mil poly bags. It is acceptable to place several bags of VFTs into a barrel lined with a second 6 mil poly bag.

5. All VFT's and mastic must be sufficiently wetted with amended water when being lifted off the floor.

6. The mastic layer may be removed either by solvent or wet buffing with a solvent. If a solvent is used, the negative air unit exhaust shall be directed down wind as much as possible, or a sufficient length of exhaust hose will be required to prevent re-entrainment of the vapors. Any solvents used for removing mastic shall be non-toxic low odor and non-flammable. A material safety data sheet for the solvent shall be provided and subject to approval by the project manager prior to use. MSDS must match solvent being used on the current jobsite.

7. During removal of the mastic with solvent or other organic based liquid, combination respiratory cartridges (organic vapor/HEPA) shall be worn to protect against asbestos and the solvent.

8. If floors are removed after walls and ceilings, full enclosure of the walls and ceiling with poly will be required, no matter what method of tile and mastic removal is used. If floors are removed prior to walls and ceilings which will eventually be removed as asbestos containing materials, then critical barriers and splash guards are all that will be required. All surfaces and materials not being removed as asbestos containing material must be covered with poly no matter which order floors walls and ceiling are abated.

9. Following removal of all floor tile and mastic, the contractor shall wash the floors thoroughly using a solution of trisodium phosphate (TSP) and water. Sufficient water shall be used for final rinsing of the floor for a clean finish.

10. If the removal of the floor mastic is on a wood substrate (or this technique is required in the scope of work), contractor is to use a mixture of the low odor mastic removal chemical and diatomaceous earth or (equivalent) to form a paste. Mix the paste to a consistency that will still be effective on the mastic and reduce the absorption of the chemical into the wood substrate, or seepage under casework and into concrete crevasses.

11. No bead blasting or shot blasting is allowed to be performed on these projects.

**20.6 Drywall Removal Requirements**

1. The doors, windows, and penetrations into the rooms shall be sealed as critical barriers with 6-mil polyethylene. An attached three stage decon with operable shower is required. The Scope of Work may require more chambers depending upon the project size.

b) Powered air purifying HEPA respirators, rubber boots, gloves, and disposable coveralls are to be used as a minimum for worker protection.

c) 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 two layers of 6-mil polyethylene within the work area (interior) and one layer of 6-mil poly on the exterior of the building. Also seal any seams in system components that pass through the work area. Remove all HVAC system filters and place in labeled 6-mil polyethylene bags for storing and eventual disposal as asbestos-contaminated waste.

4. The drywall must be double bagged and “goose-necked” in 6 mil poly bags. It is acceptable to place several “goose-necked” bags of drywall into a barrel lined with a second 6 mil poly bag that is “goose-necked”.

5. All drywall must be sufficiently wetted with amended water when being removed.

6. Negative pressure shall be established, maintained and recorded. This shall be verified by using ventilation smoke tubes.

7. Contractor, in conjunction with the District/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 certified electrician shut down and lock out electric power, and setup temporary power and lighting sources. All cost for electric supply shall be paid for by the District/Owner.

8. Contractor shall have a certified plumber disconnect and cap all water and gas within the work area. Water shall be provided by the District from a location near the work area, but not within the work area.

9. 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.

10. A critical barrier only, negative pressure check shall be required prior to the set-up of interior containment.

11. 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 will be required to protect certain flooring materials -- carpets, hardwood floors, tiles, etc. At no time will wall or ceiling surfaces be permitted to be dropped onto unprotected floors. This includes areas where the floor surfaces contain asbestos.

12. Cover asbestos-containing walls in the work area with polyethylene sheeting if these walls are to remain or if these walls are non-asbestos containing and will remain. 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.

13. Cover asbestos -containing ceilings in the work area with polyethylene sheeting if they are to remain or if these ceilings are non-asbestos-containing and will remain. 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.

14. If floor tile and drywall are to be removed within the same work area the floor tile and mastic shall be removed first, followed by the drywall removal. If the contractor wishes to submit a different removal work plan it shall be submitted prior to the beginning of the project. The HMS, Inc. Project Manager will review this work plan and respond in writing if it is accepted, or if it is accepted under condition of amendment.

15. Asbestos Abatement Contractor is required to remove nails, screws and/or other wall/ceiling material attachments.

16. Asbestos Abatement Contractor may remove studs with asbestos containing materials still attached, as long as they are to be removed, and are disposed of as asbestos-containing material.

17. Asbestos Abatement Contractor may not cut any sheer wall for any reason, without prior consent from the project Architect.

18. No damage will be permitted to studs that are to remain in place. Wall surfaces are to be peeled away, not pounded. The Contractor shall be financial responsible for any damage caused to studs.

19. Contractor is responsible for clean-up of all texturing and joint compound found on studs and rafter, as well as other surfaces behind, or inset into, the drywall materials.

20. Adhere to other requirements as stated in Sections 1-19, 21 and 22.

21. Following removal of all drywall, the contractor shall encapsulate the area with an encapsulate that is compatible with the reinstallation of wall and/or ceiling surfaces. The floors shall not be encapsulated unless otherwise noted in the Scope of Work, or stipulated by the HMS, Inc. Project Manager.

**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 HMS, Inc. Project Manager 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 HMS, Inc. Project Manager shall make the determination as to which requirements and/or specifications are more stringent. If the materials to be removed during the course of project do not relate to any of the procedures in Section 20 or multiple materials exist within the work area, the contractor shall follow those procedures outlined in Sections 1-19, 21 and 22.**

## SECTION 21. PATENTS AND PREVAILING WAGES

### 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 subcontractor's infringement of patent rights and shall indemnify Owner and Owner's representative from losses on account thereof.

### 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 apprenticeable occupations.

## SECTION 22. PERMITS AND FEES

If any permits are required to be issued for any of the Work to be performed by Contractor, Subcontractor(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 02 3100 - SUBSURFACE UTILITY INVESTIGATION

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes investigation and identification of location of overhead, surface, and underground utilities by the Contractor using firm specializing in underground utility verification.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Divisions 1 through 16 of these Specifications.
2. Section 02 4100: Demolition.
3. Section 31 2000: Earthwork.

## PART 2 - PRODUCTS

### 2.1 UTILITY VERIFICATION COMPANIES

A. Use utility verification firm specializing in underground utility location.
1. Off-site utility verification: Underground Service Alert (USA), 800/642-2444.
2. On-site utility verification:
   a. MDR Utility, (559) 827-3713.
3. Verify and stake all on-site utilities with Owner and on-site investigation prior to excavation.

## PART 3 - EXECUTION

### 3.1 INVESTIGATION

A. Prior to demolition, trenching, and earthwork operations, identify location, routing, and elevation of underground utilities in the construction area and along utility trench routings with the Owner.

B. Verify existing utilities with the service providers (i.e., power, telephone, water, sewer, cable TV, etc.) to the point of connection on site (meter, transformer, etc.)

C. Locate underground utilities using electronic detection when available, utility map analysis, and on-site survey.

D. Underground utilities include but are not limited to gas, water, sewer, storm drain, electrical power and signals (fire alarm, telephone, computer, intercom, data), and sprinkler irrigation and controls.

E. Where non-metallic utilities such as storm drain lines are in the work site, snake metallic trace lines through the line prior to electronic detection.

### 3.2 IDENTIFICATION

A. Identify underground utilities by stakes, flags, and painted lines.

B. Document the invert elevation of all cleanouts, manholes, and drainage structures.

C. Maintain staking and marking of such utilities throughout the duration of the Work.

3.3 COORDINATION

A. Coordinate the proposed routing and elevation of pipes, conduits, and trenches that are part of the Work with existing utilities.

B. Coordinate the routing and elevation of new underground utilities with existing underground utilities. Notify the Architect immediately of any conflicts, prior to proceeding with demolition, trenching, or earthwork operations.

3.4 SITE CONDITIONS

A. Where existing utilities are indicated on the drawings, extreme care shall be exercised in excavating near these utilities to avoid damage, and the Contractor will be held responsible for any damage caused by construction operations.

B. Should utilities not indicated on the drawings be found during construction, the Contractor shall promptly notify the Architect for instructions as to further action. Failure to do so will make the Contractor liable for any damage arising from construction operations after discovery of these utilities.

3.5 UNFORSEEN CONDITIONS

A. Utilities and obstructions not traceable or noted on the Drawings will be considered unforeseen. Should such lines be encountered and damaged, the Contractor shall repair such condition immediately. The cost of repairs will be compensated to the Contractor on a time-and-materials basis by change order.

**END OF SECTION 02 3100**

**SECTION 02 4210 - SELECTIVE DEMOLITION**

**PART 1 - GENERAL**

1.1 SUMMARY

A. In accordance with pertinent provisions of this Section, carefully demolish and remove from the site those items scheduled to be so demolished and removed. Section includes:
   1. Selective demolition of built site elements.
   2. Selective demolition of building elements for alterations purposes.
   3. Abandonment and removal of existing utilities and utility structures.
   4. Removal and/or relocation of designated building equipment and fixtures.
   5. Removal of designated construction.
   6. Disposal of materials.
   7. Storage of removed materials where indicated.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   1. Section 00 3100: Information about known hazardous materials.
   2. Section 01 1100: Work sequence, continued occupancy of the building, limitations on Contractor’s use of site and premises, description of items to be removed by Owner, description of items to be salvaged or removed for re-use by Contractor.
   3. Section 01 5000: Temporary enclosures, dust control barricades, security at occupied areas, waste removal, and cleanup during construction.
   4. Section 01 5710: Temporary erosion and sedimentation control.
   5. Section 01 6600: Handling and storage of items removed for salvage and relocation.
   6. Section 01 7300: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.
   7. Section 01 7330: Cutting and patching.
   8. Section 07 0150: Removal of existing roofing, roof insulation, flashing, trim, and accessories.
   9. Section 31 1000: Vegetation and existing debris removal.
   10. Section 31 2000: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.2 REFERENCES

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022.

1.3 QUALITY ASSURANCE

A. Applicable Codes: Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection. Perform demolition work in accordance with Chapter 33, 2022 California Fire Code.

B. Obtain required permits from authorities and comply with the requirements of the governing jurisdictions.

C. Do not close or obstruct egress from any building exit or site exit.

D. Do not disable or disrupt building fire or life safety systems without 3 days' prior written notice to Owner.

E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.

1.4 PROJECT CONDITIONS

A. Conduct demolition to minimize interference with adjacent and occupied properties in the general area of the project site.

B. Cease operations immediately if operations appear to be causing any detrimental effect to adjacent properties and notify Architect. Do not resume operations until directed.

**PART 2 - PRODUCTS**

(NOT USED)

**PART 3 - EXECUTION**

3.1 PREPARATION

A. Provide, erect, and maintain temporary barriers as required for the work.

B. Protect any existing improvements noted to remain or not noted for demolition.

C. Mark location and termination of utilities.

3.2 EXAMINATION

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only. By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed. Visit the site and verify the extent and location of selective demolition required.
   1. Verify that construction and utility arrangements are as shown.
   2. Carefully identify limits of selective demolition.
   3. Mark interface surfaces as required to enable workmen also to identify items to be removed and items to be left in place intact.
   4. Report discrepancies to Architect before disturbing existing installation.
   5. Beginning of alterations work constitutes acceptance of existing conditions.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permit.
   8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse,

infringe upon or limit access to their property.

B. Demolished material shall be considered property of the Contractor and shall be completely removed from the job site except where specifically noted otherwise. Do not burn or bury materials on site.

C. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

D. Do not begin removal until receipt of notification to proceed from Owner.

E. Do not begin removal until built elements to be salvaged or relocated have been removed.

F. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

G. Remove materials as demolition progresses. Upon completion of demolition, leave areas in clean condition.

H. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

I. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.3 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record

documents only.
1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.

E. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

F. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and Intrusion Alarm): Remove existing systems and equipment as indicated.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. See Section 01 1110 for other limitations on outages and required notifications.
4. Verify that abandoned services serve only abandoned facilities before removal.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

3.5 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

3.6 REPLACEMENTS

A. In the event of demolition of items not so scheduled to be demolished, promptly replace such items to the approval of the Architect and at no additional cost to the Owner.

**END OF SECTION 02 4210**

**SECTION 03 1510 - POST-INSTALLED ANCHORS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide post-installed anchors where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
   1. Definition: Post-installed anchors are concrete anchors installed in drilled holes after concrete has hardened and includes expansion anchors, screw anchors, and epoxy-type (adhesive) anchors.

B. Related Sections:
   1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work of this section.
   2. Section 03 3000: Cast-in-place concrete.
   3. Section 05 5000: Metal fabrications.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.

B. Product Data:
   1. Submit manufacturer's descriptive literature and product specifications for each product.
   2. Include data to indicate compliance with the specified requirements.
   3. Submit manufacturer's recommended installation procedures.
   4. Submit current ICC research or evaluation reports evidencing maximum allowable shear and withdrawal load data.

1.3 QUALITY ASSURANCE

A. Single Source Responsibility: To ensure consistent quality of anchorage, obtain concrete expansion anchors from a single manufacturer.

B. Manufacturer Qualifications: Provide concrete expansion anchors with current International Code Council Evaluation Service Reports acceptable to the Division of the State Architect, and in conformance with the 2022 California Building Code.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
   1. Hilti KB-TZ2 (ESR 4266).
   2. Simpson Strong-Bolt (ESR-1771).
   3. Hilti HUS-EZ (ESR-3027).
   4. SimpsonTiten HD (ESR-2713).
   5. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Finish: Type 316 stainless steel at exterior applications; zinc-plated at interior applications; mechanically galvanized or type 316 stainless steel when in contact with preservative treated lumber.

**PART 3 - EXECUTION**

3.1 PREPARATION

A. Coordinate and furnish anchorages and directions for installation from manufacturer for items to be embedded in concrete construction.

3.2 INSTALLATION

A. Fastening to In-Place Construction (New or Existing Concrete): Provide anchorage devices where necessary for securing designated items indicated on the drawings, or as necessary for a complete and proper job to in-place construction.

B. Install post-installed anchors in strict accordance with the manufacturer's written instructions.

C. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for designated items of construction. Set work accurately in location, alignment and elevation, level true and free of rack, measured from established lines and levels.

D. Concrete shall attain the specified design strength per the contract documents (2,500 psi minimum) prior to installation of post-installed anchors. Adhesive anchors shall be installed into concrete having a minimum age of 21 days at the time of installation. No anchors shall be installed into concrete that is less than 7 days old.

3.3 TESTING AND INSPECTION REQUIREMENTS

A. General Testing Requirements:
   1. For verifying satisfactory installation workmanship, an independent testing laboratory shall proof load tests for concrete expansion anchors acting in tension in the presence of the project inspector.
   2. If any anchor fails testing, test all anchors of the same type, not previously tested until 20 consecutive anchors pass, then resume the initial test frequency.
      a. If anchors are used for the support and bracing of non-structural components such as pipe, duct or conduit, the 20 consecutive anchors shall be only those anchors installed by the same trade.
   3. Continuous Inspection: Continuous inspection shall be provided during installation by project inspector.

B. Testing Frequency:
   1. Sill Plate Bolting: Test 10% of anchors.
   2. Other Structural Applications: Test all anchors.
   3. Non-structural Applications and Equipment Anchorage: Test 50% or alternate bolts in a group, including at least 1/2 of the anchors in each group.
   4. Exceptions:
      a. Undercut anchors that allow visual confirmation of full set shall not require testing.
      b. Where the factored design tension on anchors is less than 100 pounds and the anchor is clearly noted on the approved construction documents, only 10% of those anchors shall be tested.
      c. Where adhesive anchor systems are used to install reinforcing dowel bars in hardened concrete, only 25% of the dowels shall be tested if all of the following conditions are met:
         1) The dowels are used exclusively to transmit shear forces across joints between existing and new concrete.
         2) The number of dowels in any one member equal or exceeds 12.
         3) The dowels are uniformly distributed across a seismic force resisting members (such as shear walls, collectors, and diaphragms).

4) Anchors to be tested shall be selected at random by the special inspector.

d. Testing of shear dowels across cold joints in slabs on grade, where the slab is not part of the lateral force-resisting systems shall not be required.

e. Testing is not required for power actuated fasteners used to attach metal tracks of interior non-shear wall partitions for shear only, where there are at least three fasteners per segment of track.

C. Test Loads: Test loads shall be listed in the contract drawings and shall be determined by one of the following methods:

1. Twice the maximum allowable tension load or 1-1/4 times the maximum design strength of anchors as provided in the anchor's ICC-ESR or in accordance with Appendix D of ACI 318.
   a. Tension test load need not exceed 80% of nominal yield strength of anchor element ($0.8A_bF_y$).
2. Tension or torque test values from the table within the contract drawings.

D. Test Acceptance Criteria: Use the ICC-ESR for the anchor installed or the manufacturer's written instructions, acceptable to DSA. Field tests shall satisfy the following minimum requirements:

1. Hydraulic Ram Method: Anchors tested with a hydraulic jack or spring loaded devices shall maintain the test load for a minimum of 15 seconds and shall exhibit no discernible movement during the tension test, e.g. as evidence of loosening of the washer under the nut. For adhesive anchors, where other than bond is being tested, the testing devices shall not restrict the concrete shear cone type failure mechanism from occurring.
2. Torque Wrenched Method: Anchors tested with a calibrated torque wrench must attain the specified torque within 1/2 turn of the nut.
   a. Exceptions:
      1). Wedge or Sleeve type: 1/4 turn of the nut for a 3/8" sleeve anchor only.
      2). Screw Type: 1/4 turn of screw after initial seating of the screw head.

E. Testing Procedure:

1. Testing procedure shall be as required by the manufacturer’s ICC-ESR.
2. Manufacturer’s recommendation for testing may be approved by the enforcing agency, when ICC-ESR does not provide testing procedure.

**END OF SECTION 03 1510**

**SECTION 03 3000 - CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide cast-in-place concrete, including form work and reinforcement, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
   1. The work of this Section includes special precautions to reduce cracking in concrete slabs.
   2. The work of this Section includes special procedures to reduce moisture vapor emissions through interior concrete slabs.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 03 1510: Post-installed Anchors.
   3. Section 07 9210: Joint Sealants.
   4. Section 09 6110: Moisture control treatment for flooring.
   5. Section 31 2000: Earthwork.

C. Special Coordination Requirements: Coordinate with the work of the following sections to identify the finish flooring manufacturer's concrete slab requirements. Such requirements may be over and above the requirements of the Contract Documents and may require additional materials, means, or methods, which shall be included as part of the Work.
   1. Section 09 6500: Resilient flooring.
   2. Section 09 6800: Carpeting.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Mix Designs: Secure concrete mix designs from the concrete supplier or the testing laboratory in accordance with provisions of Section 01 4520, and submit to the Architect for review and approval. Distribute approved mix designs to testing laboratory, batch plant, job site, and governmental agencies having jurisdiction.
      a. Include a statement clearly indicating the concrete supplier's proposed basis of concrete mix proportions based on ACI 301-16, Section 4.2.3.
      b. When ACI 301-16, Section 4.2.3 is used, strength records used for establishing and documenting concrete mixture proportions shall not be more than 24 months old.
   2. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements for the following:
      a. Vapor barrier.
      b. Curing materials.
      c. Admixtures.
      d. Slip dowel system.
   3. Shop Drawings: Submit shop drawings for the reinforcing steel.
   4. Submit cementitious materials certification to DSA complying with CBC Section 1910A.1.
   5. Submit batch tickets of each load to the Inspector of Record.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with 2022 California Building Code except where more stringent requirements are shown or specified.

B. In accordance with CBC Section 1705A.3.5, do not place concrete until forms and reinforcement have been inspected, all preparations for placement have been completed, and preparations have been checked by the Inspector of Record, all subject to observation of the Architect, Structural Engineer and DSA.

C. Placing Record: In accordance with CBC Section 1705A.3.6, keep a concrete placing record on site recording the time and date of placing the concrete in each portion of the structure. Keep placing record until completion of the structure and make available to the inspection of the Owner, Architect, Structural Engineer, Inspector of Record, and DSA.

D. Field Mock-up: Before performing work of this Section, provide following field mock-up to verify selections made under submittals and to demonstrate aesthetic finish and texture of site concrete, parking lot concrete and fire lane concrete. Approval does not constitute approval of deviations from Contract Documents, unless Architect specifically approves deviations in writing.
   1. Form, reinforce, and cast concrete slab for 3 foot square field mock-up. One mock-up for each finish and texture specified.
   2. Concrete shall be same mix design as scheduled for Project.
   3. Perform placement and finishing work using same personnel as will place and finish concrete for Project.
   4. Mock-up shall be representative of work to be expected.
   5. Approval is for following aesthetic qualities:
      a. Compliance with approved submittals.
      b. Compliance with specified finish and texture.
      d. Compliance with specified color.
   6. Obtain mock-up approval by the Owner, Architect and Project Inspector before starting work on Project.
   7. Unacceptable mock-ups shall be removed from the site and reinstalled until the mock-up is deemed to be in compliance with the project requirements and is acceptable by the Owner, Architect and Project Inspector.
   8. Protect and maintain approved field mock-ups during construction in an undisturbed condition as a standard for judging completed work. Remove mock-up and dispose of materials when no longer required and when directed by the Architect at the end of the project.

## 1.4 NOTICE CONCERNING SLAB CURLING AND SHRINKAGE CRACKING

A. The Contractor is hereby notified that concrete construction practices and concrete materials can significantly increase the potential for cracking and slab curling, which include the following:
   1. Placement of slabs over high-moisture content subgrade.
   2. Increased mix temperature.
   3. Excessive haul in transit mixture, too long a waiting period at the project site, or too many revolutions at mixing speed.
   4. Use of smaller size aggregate under conditions where larger could have been used.
   5. Use of mixture having high shrinkage characteristics.
   6. Excessive coatings on aggregate due to insufficient washing or contamination during handling.
   7. Use of aggregates of poor inherent quality with respect to shrinkage.
   8. Exceeding the maximum water/cement ratio.

B. The Contractor is responsible for choosing concrete materials and for implementing concrete construction practices which minimize slab curling and shrinkage cracking.

## 1.5 INTERNAL MOISTURE REDUCTION

A. Moisture in Concrete Slabs:
   1. The Contractor is hereby notified that finish flooring adhesive is extremely sensitive to alkaline solutions (generally pH of 9.0 or greater). Highly alkaline solutions can be formed by moisture vapor within

concrete slabs condensing under impermeable flooring materials and combining with alkaline materials naturally occurring in concrete. Impermeable finish flooring materials include sheet vinyl, vinyl composition tile, vinyl-backed carpet, and elastomeric floor systems.

2. The Contractor is hereby notified that concrete construction practices are a major source of moisture within concrete slabs. These practices should be given proper attention to help reduce moisture within concrete slabs:
   a. Water/cement ratio too high to provide for proper hydration and densification.
   b. Lack of protection of prepared moisture barrier assembly from precipitation.
   c. Floating practices which seal the surface of the concrete and prevent proper evaporation of bleed water.
   d. Curing practices and admixtures that prevent proper hydration by rushing the process.

B. Contractor's Responsibility:
   1. Interior concrete slabs shall meet the requirements of the Contract Documents. The Contractor shall use whatever means and methods are necessary to place and maintain slabs meeting such requirements.
   2. Interior concrete slabs shall conform to additional requirements and recommendations of the finish flooring manufacturers.

1.6 SPECIAL WARRANTY

A. Manufacturer's Warranty: In addition to the warranty requirements of the Contract Documents, submit 2 copies of a warranty from the interior slab curing product manufacturer with an extended correction period of **15-years** covering labor and materials to replace or repair floor covering that fails due to moisture migration or moisture-born alkalinity contaminates originating from the concrete.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 FORMS

A. Design, erect, support, brace, and maintain formwork so it will safely support vertical and lateral loads which might be applied until such loads can be supported safely by the concrete structure.

B. Except for metal forms, use new materials. Materials may be re-used during progress of the Work, provided they are completely cleaned and reconditioned, recoated for each use, and capable of producing formwork of the required quality.
   1. Form Facing for Exposed to View Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Chamfer or radius outside corners of beams, joists, columns, and walls.

C. Slip Dowel System: Speed Dowel by Westec Barrier Technologies; #4 rebar dowels x 24" long at 18" on center, minimum of 12" sleeve.

D. Snap Ties: Snap Ties by Dayton/Richmond Concrete Accessories (Constar Supply 559-564-5012), with A-8 Waterseal Washer.

E. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not

requiring removal for satisfactory bonding of coatings to be applied.

2.3 MOISTURE BARRIER

A. Capillary Break: 3" of 3/8" natural pea gravel or 3/4" maximum crushed rock. Less than 5% passing No. 4 sieve.

B. Vapor Barrier: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Acceptable Products:
      a. Stego Wrap 15-mil Vapor Barrier by Stego Industries LLC.
      b. Vaporguard by Reef Industries.
      c. Perminator 15-mil by W.R. Meadows.
      d. Viper Vaporcheck II 15-mil Class A Vapor Barrier by ISI Building Products.
   2. Material Properties:
      a. Manufactured from prime virgin resins.
      b. Permeance Rating: ASTM F1249, 0.01 perms or lower.
      c. Permeance after Conditioning: ASTM E154, Sections 8, 11, 12, and 13: Less than 0.01 perms.
      d. Puncture Resistance: ASTM E1709, minimum 2200 grams.
      e. Tensile Strength: ASTM D882, minimum 50.0 lbf/in.
   3. Seal Tapes: Manufacturer's recommended tape for sealing seams in the vapor barrier and for sealing the vapor barrier to fresh concrete.
   4. Mastic: Manufacturer’s recommended mastic.
   5. Accessories: Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer’s instructions.

C. Compactable Slab Base: 3" of granular fill that is compactable, will remain stable, and support construction traffic.
   1. Granular fill is defined as a clean, fine grained uniformly-graded material with at least 10% to 30% of particles passing a No. 100 sieve, but not contaminated with clay, silt, or organic material.
   2. Expansion Index: < 15
   3. The use of clean concrete sand will not be permitted.

2.4 REINFORCEMENT

A. Comply with the following as minimums:
   1. Bars: ASTM A615, Grade 40 for #3 bars and smaller, Grade 60 for #4 bars and larger, using deformed bars for #3 and larger.
   2. Bending: ACI 318-19, Section 26.6.3.
      a Bars shall be limited to one shop or field bend at any location on the bar.
      b. Partially embedded bars shall not be field bent, except as indicated on the Drawings or permitted by the Architect.
      c. A bar bent in the incorrect location shall not be straightened; such bars shall be discarded.

B. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in ACI 318-19.

C. Do not use reinforcement having any of the following defects:
   1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances;
   2. Bends or kinks not indicated on the Drawings or required for this Work;
   3. Bars with cross-section reduced due to excessive rust or other causes.

D. Shop fusion welded stirrup/tie cages shall be permitted provided they are in conformance with CBC 1903A.8.

2.5 CONCRETE

A. Portland Cement: ASTM C150, Type II.

B. Fly Ash: May be used as a partial substitute for Portland cement as follows:
1. Fly ash: ASTM C618, Class N or F (Class C is not permitted).
2. Fly ash used may be included in the water/cement ratio calculation.
3. Not more than 20% by weight of fly ash shall be substituted for Portland cement.

C. Normal Weight Aggregate: ACI 318 Section 26.4.1.2.1(a).(1) and ASTM C 33, except as modified in CBC Section 1903A.5. Provide aggregates from a single source for exposed concrete.

D. Water: ACI 318-19, Section 26.4.1.4.

E. Admixtures:
1. Do not use calcium chloride admixtures.
2. Admixtures are not permitted without approval from Architect and DSA.

2.6 NORMAL WEIGHT CONCRETE DESIGN MIX

A. Proportions: Concrete mix shall be proportioned based on field experience or trial mixtures in accordance with ACI 318-19, Section 26.4.3, and ACI 301-16, Section 4.2.3.
1. Mix design submittals shall include a statement clearly indicating the concrete supplier's proposed basis of concrete mix proportions through the use of one of the following:
a. Field experience under ACI 301-16 paragraph 4.2.3.4a, or
b. Trial mixtures under ACI 301-16 paragraph 4.2.3.4b.
2. When ACI 301-16, Section 4.2.3 is used as the concrete supplier's proposed basis of concrete mix proportions, strength records used for establishing and documenting concrete mixture proportions shall not be more than 24 months old.

B. Design Professional: A registered civil or structural engineer, licensed in California, with experience in concrete mix design shall select the relative amounts of ingredients to be used as basic proportions of the concrete mixes proposed for use (per DSA IR 17-13).
1. Mix design submittals shall include the engineer’s stamp and signature.

C. Cement Content: Minimum of 5.5 sacks of cement per cubic yard, unless otherwise noted below.
1. Minimum of 5.0 sacks of cement per cubic yard for rat slabs.
2. Off-site concrete shall conform to governing agency standards.

D. Type A Water Reducer (interior slab on grade only): 28.20 oz/cy, plus or minus 20%.

E. Water/Cementitious Material Ratio:
1. Footings: Maximum of 0.56.
2. Site Concrete: Maximum of 0.67.
3. Interior Slabs/Parking Lots/Fire Lanes: Maximum of 0.50.

F. Minimum Compressive Strength:
1. Footings, interior slabs, parking lots, fire lanes, retaining wall and equipment pads: 3,000 psi at 28 days.
2. Site Concrete and rat slabs: 2,500 psi at 28 days.

G. Aggregate Gradation Optimization:
1. Workability Factor: 32-42%; **target 35%.**
2. Coarseness Factor: 52-72%; **target 60%.**
3. Fineness Modulus: 2.80 to 3.10.

4. Paste Fraction: 27% plus or minus.
5. Mortar Fraction: Passing the No. 8 sieve.
   a. ¾" to 1" aggregate: 55-57%.
   b. 1-1/2" aggregate: 53-54%.

H. Aggregate Gradation Limits of Combined Mixture:

| Sieve Size | % Passing | |
|---|---|---|
| | **Interior Slabs Parking Lots Fire Lanes 1-1/2"** | **Footings Site Concrete Rat Slab Retaining Walls 1"** |
| 2" | 100 | -- |
| 1-1/2" | 95-100 | 100 |
| 1" | 80-96 | 94-100 |
| 3/4" | 65-80 | 87-99 |
| 1/2" | 55-65 | 65-78 |
| 3/8" | 45-60 | 55-64 |
| #4 | 35-50 | 40-55 |
| #8 | 25-38 | 33-43 |
| #16 | 20-30 | 19-32 |
| #30 | 10-20 | 9-24 |
| #50 | 2-12 | 4-12 |
| #100 | 1-6 | 1-8 |
| #200 | 0-4 | 0-4 |

I. Slump Limits: Proportion and design mixes for slump at point of placement of 4" plus or minus 1".

J. Concrete Temperature: 90 deg F maximum at time of placement.

K. Ready-Mix Concrete: Comply with ASTM C94, and as herein specified.

2.7 LIGHTWEIGHT CONCRETE DESIGN MIX

A. Proportions: Concrete mix shall be proportioned based on field experience or trial mixtures in accordance with ACI 318-19, Section 26.4.3, and ACI 301-16, Section 4.2.3.
   1. Mix design submittals shall include a statement clearly indicating the concrete supplier's proposed basis of concrete mix proportions through the use of one of the following:
      a. Field experience under ACI 301-16 paragraph 4.2.3.4a, or
      b. Trial mixtures under ACI 301-16 paragraph 4.2.3.4b.
   2. When ACI 301-16, Section 4.2.3 is used as the concrete supplier's proposed basis of concrete mix proportions, strength records used for establishing and documenting concrete mixture proportions shall not be more than 24 months old.

B. Aggregate: Expanded shale, vacuum saturated or thermal quenched; ASTM C330.
   1. Maximum Lightweight Aggregate Size: 3/4".

C. Shrinkage Control: Aggregate shall be prepared within 72 hours of being used or be re-wetted for 1/2 hour, twice a day if longer storage is required at the plant.

D. Compressive Strength: 3,000 psi at 28 days. Polished concrete: 3,500 to 4,000 psi at 28 days.

E. Slump Limits: 3" plus or minus 1", measured at the end of the discharge line.

F. Cement Content: Minimum 6.0 sacks of cement per cubic yard.

G. Water/Cement Ratio: 0.50 maximum, measured on free water only.

H. Maximum Lightweight Aggregate Size: 3/4".

I. Entrained Air: 4% to 7%.

J. Weight: 110 pounds per cubic foot, plus or minus 3 pounds.

2.8 CURING MATERIALS

A. Interior Slabs with floor covering (resilient flooring and carpet): Concrete surface treatment applied the day of the concrete placement; volatile organic compound (VOC) content rating as required to suit regulatory requirements.
   1. Acceptable Products:
      a. PMC3300 by Curranseal, www.curranseal.com.
      b. VC-5 by Sinak Corporation, www.sinak.com.
      c. Synthetics 10S by Synthetic International, www.syntheticsintl.com.

B. Interior Slabs with tile, polished concrete, sealed concrete or bare concrete: Curing blanket, 4 mil white opaque polyethylene laminated over 10 oz. burlap; ASTM C171.

C. Exterior Flatwork Receiving Traffic Coatings: Curing blanket, 4 mil white opaque polyethylene laminated over 10 oz. burlap; ASTM C171.

D. Exterior Flatwork on Grade: Clear, Curing compound, colorless, non-yellowing material containing 30% solids content minimum; ASTM C309.
   1. Shall not discolor concrete or other materials, shall not leave an oily residue upon evaporation of solvent.
   2. Shall afford moisture loss not greater than 0.055 grams/$cm^2$ at minimum average of 300 square feet.
   3. Meet State of California Air Regulation Board Solvent Emission Standards.
   4. Curing compounds may not be used on areas to receive traffic coatings unless specifically accepted by the traffic coating manufacturer.
   5. Solvent borne acrylic cure and seal products are not acceptable; ASTM C1315.

2.9 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. Expansion Joint Filler: Comply with ASTM D1751 or provide resin-impregnated fiberboard conforming to ASTM D1752.

C. Non-shrink Grout:
   1. Factory premixed grout; ASTM C1107.
   2. Compressive strength: 7,000 psi at 28 days.

D. Dry Pack Grout: One part Portland Cement to two parts fine sand.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Coordinate with Section 31 2000 – Earthwork prior to placing any concrete.

3.2 MOISTURE BARRIER

A. Installation of Capillary Break:
   1. Prior to placing the rock capillary break, provide trench for all materials laid on the subgrade (i.e. piping and conduits), so that no material will project more than 3/4" above the subgrade.
   2. Evenly spread pea gravel over compacted subgrade.

B. Install vapor barrier in accordance ASTM E1643:
   1. Level and tamp or roll aggregate, sand or tamped earth base.
   2. Install vapor barrier in strict accordance with the manufacturer's written instructions, taping all joints and installing the manufacturer's pipe boots at all penetrating pipes and conduits.
   3. Unroll vapor barrier with the longest dimension parallel with the direction of the pour.
   4. Overlap joints 6" minimum and seal with manufacturer’s tape.
   5. Seal vapor barrier to footings or concrete stemwall per manufacturer’s instructions.
   6. Seal all penetrations (including pipes) per manufacturer’s instructions.
   7. **No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.** Use slab forming and screeding methods and products which do not puncture the vapor barrier.
   8. Repair damaged areas by cutting patches of vapor barrier, overlap damaged area 6", and tape all four sides with tape.
   9. Where ganged conduits are required, bundle with manufacturer’s tape and fill voids with mastic.

C. Installation of Slab Base:
   1. Slab base material is a granular fill that is compactible, easy to trim, and will remain stable and support construction traffic.
   2. Cover vapor barrier with granular fill spread evenly to 3" thickness with a tolerance of +0" / -1" when measured from the bottom of the slab.
   3. Hold granular fill 12" away from exterior walls.
   4. Proof roll granular fill after installation to determine if it is uniformly stable to provide adequate bearing support during and after construction.
   5. **Moisture Content:** Granular fill moisture content shall be **below 6%** at time of concrete placement. If granular fill is saturated prior to placement of concrete, remove the material and replace.
   6. If rain is forecast prior to continuation of slab placement, remove granular fill adjacent to completed slab, cut and fold back vapor barrier over slab and seal to protect from water penetration into granular fill under existing concrete slab. Prior to continuing slab placement, fold back the vapor barrier, provide vapor barrier transition with minimum of 6" lap continuous both sides, replace granular fill and continue with concrete placement.

D. Protection of Installed Slab Base:
   1. Protect all installed slab base construction from precipitation and water penetration by covering and providing positive drainage away from the slab base.
   2. Cover slab openings and blockouts around columns to prevent penetration of water into the slab base and capillary break.

3.3 FORMWORK INSTALLATION

A. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.
   1. **Non-Exposed Surfaces:** Where concrete surfaces are not exposed to view, construct formwork conforming to a Class B Surface, Paragraph 4.8.3 of ACI PRC-117.1-14.
   2. **Exposed Surfaces:** Where concrete surfaces are exposed to view, construct forms so that concrete surfaces will have a tolerance of 1/2 of the tolerance limits of a Class A Surface, Paragraph 4.8.3 of ACI PRC-117.1-14.

B. Forms shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together to maintain position and shape. Forms and their supports shall be designed so as not to damage previously placed structure.
   **1. Slab Forming Techniques: Do not puncture the vapor barrier.**

C. Textured Forms: Use textured forms or form liners where indicated on the Drawings of plastic, wood, or sheet metal.
   1. Secure liners in forms by cementing or stapling.
   2. Do not permit impressions of nail heads, screws heads, or washers to transfer to the surface of the concrete.
   3. Seal edges of the textured panels to each other or to divider strips to prevent bleeding of cement paste.
   4. Use sealant that will not stain concrete surface.

3.4 SOIL TREATMENT OF SIDEWALK AND PAVEMENT AREAS WITH HERBICIDES

A. Just prior to placing concrete for pavements and sidewalks, apply herbicide soil treatment at recommended rates for application. Protect desirable vegetation from herbicide treatment.

B. Herbicide shall bear evidence of registration under Federal Insecticide, Fungicide, and Rodenticide Act for weed control application.

3.5 REINFORCING

A. Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.
   1. Clean reinforcement and remove loose dust and mill scale, earth, oil, and other materials which reduce bond or destroy bond with concrete.
   2. Position, support, and secure reinforcement against displacement by forms, construction, and the concrete placement operations. Provide metal chairs, dobies, or other aids manufactured for this purpose.
   3. Place reinforcement to obtain the required coverages for concrete protection.
   4. Reinforcement of site concrete and fire lane paving shall be placed at 2” below the concrete surface unless otherwise shown.
   5. Unless otherwise shown or noted on the Drawings, lap bars as noted on Lap Schedule in structural drawings.
   6. Partially embedded reinforcing shall not be bent without the approval of the DSA.

3.6 EMBEDDED ITEMS

A. Do not embed piping, other than electrical conduit, in structural concrete. See structural drawings for provisions for pipes, sleeves, conduits or other penetrations into or through the footings.

B. Set bolts, inserts, and other required items in the concrete, accurately secured so they will not be displaced, and in the precise locations needed. **IN NO CASE SHALL ANY BOLT OR ANCHOR BE STABBED IN PLACE WHILE OR AFTER THE CONCRETE IS POURED.** Evidence of stabbing will necessitate testing at the expense of the contractor.

C. **Slip Dowel System:** Install in accordance with manufacturer's written recommendations.

3.7 MIXING CONCRETE

A. Transit mix the concrete in accordance with provisions of ASTM C94.
   1. Water shall only be added at the beginning of discharge and shall be a one-time addition of water. At a minimum, the drum shall be turned an additional 30 revolutions after addition of water. After discharge has begun the addition of water is prohibited.
   2. Discharge of the concrete shall be completed within 90 minutes, or before the drum has revolved 300 times after the cement has been exposed to the mixing water or aggregates.

B. Cold Weather Requirements:
   1. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing weather. All concrete materials and all reinforcement, forms, fillers, and ground with which concrete is to come in contact shall be free from frost. Frozen materials or materials containing ice shall not be used.
   2. When mixing concrete during freezing or near-freezing weather, the mix shall have a temperature of at least 55 deg F., but not more than 90 deg F. When necessary, concrete materials shall be heated before mixing. Special precautions shall be taken for the protection of transit-mixed concrete.
   3. The concrete shall be maintained at a temperature of at least 55 deg F. for not less than 72 hours after placing. After the initial curing period allow the concrete surface to dry prior to exposure. Do not permit the concrete to cool faster than the rate of 5 deg F per hour or more for the first 24 hours.

C. Hot Weather Requirements:
   1. During hot weather, proper attention shall be given to ingredients, production methods, handling, placing, protection and curing to prevent excessive concrete temperatures or water evaporation that may impair required strength or serviceability of the member or structure.
   2. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

3.8 PLACING CONCRETE

A. Concrete shall not be placed until the forms and reinforcement have been inspected, all preparations for the placement have been completed, and the preparations have been checked by the Inspector of Record, all subject to the observation of the structural engineer or Architect.

B. Preparation:
   1. Remove foreign matter accumulated in the forms.
   2. Rigidly close openings left in the formwork.
   3. Wet wood forms sufficiently to tighten up cracks; wet other material sufficiently to maintain workability of the concrete.
   4. Use only clean forms and tools.

C. Conveying: ACI 318-19, Section 26.5.2.1.

1. Concrete shall be conveyed from mixer to place of final deposit by methods that will prevent separation or loss of materials.
2. Conveying equipment shall be capable of providing a supply of concrete at site of placement without separation of ingredients and without interruptions sufficient to permit loss of plasticity between successive increments.
3. Remove rejected concrete from the job site.

D. Placing Concrete in Forms: ACI 318-19, Section 26.5.2.1.
1. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concreting shall be carried on at such a rate that concrete is at all times plastic and flows readily into spaces between reinforcement.
2. Where concrete is placed in lifts, each lift shall be thoroughly consolidated before the next layer is placed. The rate of placement shall be rapid enough so that previously placed concrete has not yet set when the next lift of concrete is placed upon it. Do not allow flow lines, seams, and planes of weakness (cold joints) to form as a result of placement means and methods.

E. Placing Concrete Slabs:
1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
2. Bring slab surfaces to the correct level with a straightedge, and then strike off.
3. Use wood bullfloats or darbies to smooth the surface, leaving the surface free from bumps and hollows.
4. Do not sprinkle water on the plastic surface. Do not disturb the slab surface prior to start of finishing operations.

## 3.9 CONSOLIDATION

A. All concrete shall be thoroughly consolidated by suitable means during placement and shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
1. Where conditions make consolidation difficult, or where reinforcement is congested, batches of concrete adjusted to use smaller size aggregates shall be used as approved by the structural engineer and the enforcement agency.
2. Do not vibrate forms or reinforcement.
3. Do not use vibrators to transport concrete inside the forms.
4. Perform consolidation by experienced personnel.

## 3.10 JOINTS

A. Construction Joints (CJ):
1. Do not use horizontal construction joints except as may be shown on the Drawings.
2. If additional construction joints are found to be required, secure the Architect's approval of joint design and location prior to start of concrete placement.
3. Joints shall be constructed in accordance with ACI 318-19, Section 26.5.6.

B. Isolation Joints (IJ):
1. Do not permit reinforcement or other embedded metal items that are being bonded with concrete (except dowels in floors bonded on only one side of the joints) to extend continuously through any isolation joint, unless specifically noted.
2. Fill isolation joints full depth with joint material approved by the Architect.
3. Provide isolation joints as shown on plans.

C. Crack Control Joint (CCJ):
1. Provide template or guide as required for straight sawcut.
2. Joints shall be spaced as indicated on the Drawings, but not more than 10'-0" on center.
a. Joints shall be placed to produce panels that are as square as possible and never exceed a length to

width ratio of 1 ½ to 1 – in which case additional joints shall be installed.

3. Saw cut joints before concrete begins to cool, within 2 to 12 hours after placing.
4. Use 1/8" thick blade and cut at least 1" deep but not less than one third (1/3) the depth of the slab.

3.11 CONCRETE SLAB FINISHING

A. Finish work shall be performed in accordance with ACI 302.1R-15, Chapter 10.

B. Finished Slab Surfaces: Except as may be shown otherwise on the Drawings, provide the following finishes at the indicated locations:
   1. Scratch Finish: Apply to monolithic slab surfaces that are to receive concrete floor topping or mortar setting bed.
   2. Float Finish: Apply to monolithic slab surfaces that are to receive trowel finish and other finishes specified hereinafter, and to slab surfaces which are to be covered with tile on a setting bed.
   3. Trowel Finish: Apply to interior monolithic slab surfaces that are to be exposed to view, unless otherwise shown, and to slab surfaces that are to be covered with resilient flooring, carpeting, thin-set tile, paint, or other thin-film finish coating system.
   4. Non-slip Broom Finish: Apply to exterior walks, stairs, drives, ramps, and similar pedestrian and vehicular areas. Coordinate required final finish with Architect before application.
      a. Medium broom finish for slopes < 5%.
      b. Heavy broom finish for slopes ≥5%.

C. Finish Concrete Slab Tolerances:
   1. Slabs shall be level unless slope is otherwise specified.
   2. Tolerances of finished slab surfaces shall comply with ACI 117.1R-14 "Class A Surface Finish Tolerance". Depressions in floor between high spots shall not be greater than 1/8" between a 10' long straight edge.
   3. Depressed surfaces shall be leveled with an approved filler and sanded smooth.
   4. High spots shall be ground down until level. Remove dislodged aggregate and patch floor.
   5. Grind or fill surface defects which would telegraph through applied floor covering systems.
   6. Owner reserves the right to test floors and concrete members for conformance to ACI 117.1R-14 Tolerance Specifications by Use of the "Dipstick Floor Profiler". Should tolerances not be within the limits specified, the Contractor shall be required to pay for all testing costs and repairs required to bring materials into compliance.

D. Exterior Flatwork Edge and Joint Finishing:
   1. Finish slab edges, including those at formed joints, with an edger having a radius of 1/8".
   2. Edge transverse joints prior to brooming. Brooming shall eliminate the flat surface left by the surface face of the edger.
   3. Corners and edges which have crumbled and areas which lack sufficient mortar for proper finishing shall be cleaned and filled solidly with the properly proportioned mortar mixture and then finished.

E. Required Grinding of Interior Slab:
   1. The Contractor shall anticipate that grinding will be required as a result of curling or other slab defects. Grinding required to bring the slab surface into acceptable tolerances for finished flooring installation shall be included as part of the Work.
   2. Provide a slip resistant surface after grinding and filling with a 0.6 coefficient of friction at exposed slabs and exterior flatwork.

3.12 CURING

A. ACI 318, Section 26.5.3: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Curing Methods with Surface Applied Curing Products: Apply curing products immediately after concrete

finishing in strict accordance with the manufacturer's written installation instructions.

C. Curing Methods with Curing Blankets:
1. Cure a minimum of 7 days.
2. Provide wet covering of laminated burlap-polyethylene sheets. Lay burlap side down, lap joints 12" minimum and seal penetrations. Keep covering continuously moist, maintaining a film of water on concrete surface at all times. Install sheets in strict accordance with the manufacturer's written recommendations.
3. Curing shall not be interrupted by removal of the wet covering sheets for any reason during the curing process. No work shall be performed over the curing slabs during the curing process.
4. The concrete shall be maintained above 50 deg F during the curing process.
5. Do not use alternate methods unless specifically approved in writing by the Architect.

D. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Avoid rapid drying at end of final curing period.

E. Protection of Slabs After Curing: After curing is completed, do not allow water to stand on completed slabs. Remove standing water as soon as possible.

3.13 REMOVAL OF FORMS

A. ACI 318, Section 26.11.2.
1. Forms shall be removed in such manner as not to impair safety and serviceability of the structure. All concrete to be exposed by form removal shall have sufficient strength not to be damaged thereby.

B. No portion of the forming and shoring system may be removed less than 12 hours after placing concrete. When stripping time is less than the specified curing time, measures shall be taken to provide adequate curing and thermal protection of the stripped concrete.
1. Do not remove shoring until the member has acquired sufficient strength to support its own weight, the load upon it, and the added load of construction.
2. Do not strip vertical concrete in less than 7 days.

C. Finished Surfaces:
1. Exercise care in removing forms from finished concrete surfaces so that surfaces are not marred or gouged.
2. Release sleeve nuts or clamps, and pull the form ties neatly.
3. Do not permit steel spreaders, form ties, or other metal to project from, or be visible on, any concrete surface except where so shown on the Drawings.

D. Repair of Surface Defects: Repair or replace deficient work at no additional cost to the Owner.
1. Repair tie holes and other surface defects immediately after formwork removal.
2. Where the concrete surface will be textured by sandblasting or bush-hammering, repair surface defects before texturing.
3. Repair tie holes and surface defects to match surrounding concrete color and surface texture.
4. Repair tie holes and surface defects in conformance with ACI 301-16, Paragraph 5.3.7.

3.14 SURFACE FINISH OF VERTICAL CONCRETE SURFACES

A. Unexposed Form Finish: Rub down or chip off fins or other raised areas.

B. Exposed (to view) Form Finish: Rub down or chip off and smooth fins or other raised areas.
1. As-Cast Finish: Provide surface finish 3.0 in accordance with ACI 301-16, Paragraph 5.3.3.3.
2. Rubbed Finish:
a. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more

than 24 hours after form removal.

b. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.

c. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.

3.15 FINISH OF CURBS AND GUTTERS

A. Finish of Curbs and Gutters:
1. Tool edges of gutter and top of curb with an edging tool to a radius of 1/2"
2. Float and finish surfaces with a smooth wood float until true to grade, section and uniform in texture.
3. Brush floated surfaces with a fine-hair brush using longitudinal strokes.
4. Immediately after removing the front curb form, rub face of curb with wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. While still wet, brush surface in the same manner as the gutter and curb top.
5. Finish the top surface of gutter and entrance drives to grade with a wood float.

3.16 MISCELLANEOUS CONCRETE ITEMS

A. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.

B. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

C. Dry Pack Grout:
1. Pack solid under sill plates where indicated to provide continuous bearing.
2. Provide dry pack prior to installation of roof framing.

3.17 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Testing of concrete materials shall comply with Section 01 4520, CBC Chapter 17A, and CBC Section 1910A.

B. The Owner will employ a testing laboratory to perform tests and to submit test reports. Sampling and testing for quality control during placement of concrete may include the following, as directed by the Architect.

C. Compaction and Moisture Testing sub-grade.
1. Test sub-grade immediately prior to placing any concrete or placing a vapor barrier as described in Section 31 2000 – Earthwork.

D. Sampling Fresh Concrete: Comply with requirements of ASTM C172.
1. Slump: ASTM C143; 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.
2. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens are made.
3. Compression Test Specimen: ASTM C31; one set of 4 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.
4. Compressive Strength Tests: ASTM C39; one set for each day's pour, but not less than one set for each 50 cubic yards or each 2,000 square feet of surface area of slabs or walls for each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days; and one specimen retained in reserve for later testing if required.
5. 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.

E. Batch Plant Inspection:
   1. Continuous batch plant inspection during mixing will be required on this project for structural concrete, including but not limited to footings, foundation walls, retaining walls, columns, and floor slabs in compliance with CBC Section 1705A.3.3.
   2. Batch plant inspection may be waived in accordance with CBC Section 1705A.3.3.1.

F. Reinforcing Steel Testing **will be required on this project**, except for non-structural concrete work. Comply with CBC Section 1910A.2; testing will be waived if mill certificates are provided.

G. Slab Finish Tolerance Testing: Where requested by the Architect, test slabs for finish tolerance in accordance with ACI 117 Tolerance Specifications by Use of the "Dipstick Floor Profiler".

H. 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.

I. Non-Destructive Testing: Rebound hammer, sonoscope, or other non-destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

J. 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. The Owner shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.
   4. The Owner shall be compensated for such additional testing by deducting the additional costs from the General Contractor’s final payment.

**END OF SECTION 03 3000**

**SECTION 05 5000 - METAL FABRICATIONS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide miscellaneous metal work shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 09 9100: Field painting of steel members.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data:
a. Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
b. Submit manufacturers recommended installation procedures.
2. Shop Drawings: Submit shop drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.

1.3 QUALITY ASSURANCE

A. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.

B. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedures" and CBC Section 2204A.1.

C. Codes and Standards: Comply with provisions of the following: California Building Code, 2022 Edition.

1.4 MOCK-UPS

A. Ornamental Railing: After shop drawing review, and prior to fabrication of ornamental railing, fabricate full size mock-up including at a minimum, 4 circle insets, top pipe rail, intermediate horizontal rails, 4 pickets, and 1 vertical support post, and typical connection between rail panels. **Mock-up shall demonstrate the finishes and workmanship required by the Contract Documents.**

B. Acceptance: If, upon review by the Architect, the mock-up is found to be satisfactory, the mock-up shall be used as the basis, along with the other provisions of the Contract Documents, for determining the acceptability of ornamental railings provided as part of the work of this Section. The accepted mock-up shall remain on the project site until completion of the Work.

C. Rejection: If, upon review by the Architect, the mock-up is found to be unsatisfactory, remove the mock-up, revise and rework as required, and provide a new mock-up for further review.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Comply with following standards, as pertinent, unless otherwise noted in the documents.
1. Steel Tubing: ASTM A500, Grade C cold-formed structural tubing.
2. Steel Pipe: ASTM A53, Type S, Grade B, standard weight or extra-strong as noted in the plans.
3. Welding Materials: AWS D1.1; type required for materials being welded.

2.2 FASTENERS

A. General:
1. For exterior use and where built into exterior walls, provide zinc-coated fasteners.
2. Provide fasteners of type, grade, and class required for the particular use.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.4 FINISHES

A. Primer: 10-99 by Tnemec or No. 5269 by Rustoleum.

B. Provide zinc coating for those items indicated or specified to galvanized, as follows:
1. ASTM A153 for galvanizing iron and steel hardware.
2. ASTM A123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strips 1/8" thick and heavier.
3. ASTM A386 for galvanizing assembled steel products.
4. ASTM A535 for galvanizing sheet steel.

C. For repair of galvanizing, use a high zinc-dust content paint complying with MIL-P-21035.

D. Special Paint Coatings Primer: Use products specified in Section 09 9600 and produced by the same manufacturer of finish coat where special coatings are indicated for exposed exterior structural steel.

2.5 FABRICATION

A. Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.

B. In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, rolled trade names, and roughness.

C. Fabricate with accurate angles and surfaces which are true to the required lines and levels, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.

D. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use. Cut, reinforce, drill, and tap miscellaneous metal work as

required to receive finish hardware and similar items.

E. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.

F. Curved work shall be evenly sprung.

2.6 FABRICATED ITEMS

A. Rough Hardware: Provide bent or otherwise custom fabricated bolts, plates, anchors, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting work, and for anchoring or securing work to concrete or other structures.
   1. Provide galvanized rough hardware at exterior conditions.

B. Miscellaneous Framing and Supports: Provide miscellaneous framing and supports not a part of the structural steel framework, as required to complete the work.
   1. Fabricate miscellaneous units to shapes, sizes, and profiles indicated, or if not indicated, of required dimensions to receive adjacent work. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware and similar items.
   2. Provide galvanized framing and supports at exterior conditions.

C. Steel Handrails, Guards, and Railings: Provide round pipe or square tubing as indicated on the Drawings.
   1. Round Pipe: 1-1/2" nominal diameter standard weight galvanized steel pipe, 0.145" wall thickness.
   2. Square Tubing: 1-1/2" galvanized steel square structural tubing, 0.1875" wall thickness.
   3. Wall Brackets: No. 377/378 by Julius Blum, or No. 1703-2 by R&B Wagner, with bracket filler for either gypsum board or plaster.
   4. Fabrication:
      a. Provide flush fittings with joints welded and ground smooth and flush. Weld vertical supports to horizontal members in same manner as fittings.
      b. Remove burrs from all exposed cut edges.
      c. Miter or radius all joints as required. Form elbow bends and wall returns to uniform radius, free from buckles and twists, with smooth finish surfaces, or use prefabricated bends.
      d. Provide wall returns at ends of wall mounted handrails to with 1/8" of wall.
      e. Close exposed ends by welding 3/16" minimum thickness steel plate in place or with prefabricated fittings.
      f. Provide galvanized steel sleeves for concrete embedment where indicated.
      g. Secure ends of members butted to vertical surfaces with galvanized steel flanges.
      h. Secure handrails to walls with brackets spaced at 5'-0" on center maximum.
      i. Provide vertical posts at the spacing indicated, but not more than 5'-0" on center.
      j. Welding: Accurately miter and cope intersections of posts and rails and weld all around. Thoroughly fuse without undercutting or overlap. Remove spatter, grind exposed welds and contour surfaces to match those adjacent.
      k. Provide pressure relief holes at closed ends.

2.7 SHOP PAINTING

A. Surface Preparation: Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B): SSPC-SP6, Commercial Blast Cleaning.
2. Interiors (SSPC Zone 1A): SSPC-SP3, Power Tool Cleaning.

B. Cleaning: Clean ferrous and galvanized metal surfaces with proper solvents to remove all grease and other foreign matter which will hinder and/or prevent proper finishing and installation.

C. Application: Apply 1 coat of shop primer to the dry film thickness recommended by the manufacturer to surfaces of metal fabrications except those which are indicated to be embedded in concrete or masonry and in compliance with requirements of SSPC-PA1, Paint Application Specification No. 1, for shop painting.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 COORDINATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 INSTALLATION

A. General:
1. Set work accurately into position, plumb, level, true, and free from rack.
2. Anchor firmly into position.
3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.
4. Grind exposed welds smooth, and touch up shop prime coats.
5. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.

B. Primer Repair: Immediately after erection, clean the field welds, bolted connections, and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.

C. Galvanizing Repair: Repair all damage to galvanizing as a result of fabrication, handling, and installation, with 2 coats of cold galvanizing paint in accordance with the manufacturer's written instructions.

D. Pipe Railings and Handrails: Unless otherwise indicated or approved by the Architect:
1. Secure to wall with approved fasteners into solid blocking.

**END OF SECTION 05 5000**

# SECTION 06 1100 - ROUGH CARPENTRY

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Provide lumber, construction panels, structural composite wood, nails, bolts, screws, framing anchors and other rough hardware, and other items needed, and perform rough carpentry for the construction shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 06 4000: Architectural woodwork.
3. Section 07 2420: Direct Applied Exterior Finish System.

### 1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements for the following:
   a. Framing anchors.
   b. Preservative treatment.
2. Installation Procedures: Submit manufacturers recommended installation procedures.

B. Machine Nail Samples: Contractor shall allow the Inspector to take random samples from actual machine nail containers proposed for use on the project. Samples shall be reviewed and accepted prior to any machine nailing. Nails sampled shall meet the requirements for machine nailing indicated on the Drawings.

### 1.3 QUALITY ASSURANCE

A. Codes and Standards:
1. All material and workmanship shall comply with CBC Chapter 23 and ANSI/AWC NDS 2018.
2. **Lumber standards:** DOC PS-20-05 American Softwood Lumber Standard, with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review. Factory mark all lumber indicating the specie and grade of each piece.
3. **Inspection Agencies:** All lumber shall be graded in accordance with Standard Grading Rules for West Coast Lumber, No. 17 by West Coast Lumber Inspection Bureau (WCLIB), or Western Lumber Grade Rules, latest edition by Western Wood Products Association (WWPA).
4. **Plywood Panel Standards:** DOC PS–1-09 Construction and Industrial. For products not manufactured under PS-1 provisions, with American Plywood Association (APA) Performance Standard and Policies for Structural-Use Panels, Form No. E445. Plywood used for structural purposes shall be marked "APA W/EXT GLUE" and shall be span-rated sheathing. Factory-mark each plywood panel with APA trademark evidencing compliance with grade requirements.
5. **Preservative Treatment:** Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Rejection:
1. Below-grade material shall not be used as load-carrying members which have been designed for specified allowable stresses and acceptable safety factors.
2. Any material which falls below grade shall be rejected for load-carrying use.

C. Prefabricated (off-site built) wall framing:
   1. Where fabrication of structural, load-bearing or lateral load-resisting members or assemblies is being conducted “off-site”, special inspections of the fabricated items shall be performed during fabrication. Inspection shall be periodic unless otherwise deemed necessary for continuous inspection.
   2. All costs associated with “off-site” wall framing will be paid directly by the Owner to the Project Inspector or Lab of Record, but these costs shall be invoiced to the Contractor by the Owner and withheld from payments and/or retention.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. Protection:
   1. Deliver the materials to the job site and store, in a safe area, out of the way of traffic, and shored up off the ground surface.
   2. Identify framing lumber as to grades, and store each grade separately from other grades.
   3. Protect metals with adequate waterproof outer wrapping.
   4. Use extreme care in off-loading of lumber to prevent damage, splitting, and breaking of materials.

**PART 2 - PRODUCTS**

2.1 LUMBER

A. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by DOC PS-20-05, for moisture content specified for each use.
   1. Provide dressed lumber, S4S, unless otherwise indicated.
   2. Provide seasoned lumber with 19% maximum moisture content at time of dressing and shipment, and at time of use, unless otherwise indicated.

B. Slope of grain of lumber used in tension members shall not exceed 1:8 slope.

C. Framing lumber shall be No. 1 Douglas Fir, unless otherwise indicated on the drawings.

D. Where wood member are in contact with masonry or concrete, use No. 1 Douglas Fir pressure treated with an approved factory preservative treatment as specified in this Section.

E. **ALL 3X AND LARGER MATERIAL SHALL BE "FREE OF HEART CENTER".**

F. Fascia: Provide Hem-Fir material at all finished fascia boards and at fascia boards covered with metal fascia and trim.

2.2 CONSTRUCTION PANELS

A. Plywood: Exterior Grade with exterior glue, graded to conform to DOC PS-1-09.

B. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant treated plywood panels with grade designation, APA A-C PLUGGED and SANDED INT with exterior glue, 3/4" thick.

C. Roof Sheathing: APA Rated Sheathing, C-D, Exposure 1; thickness and span index as indicated.

D. Wall Sheathing: APA Rated Sheathing, C-D, Struct I, Exposure 1; thickness and span index as indicated.

E. Underlayment: Particleboard, ANSI A208.1, Grade PBU, 3/8" minimum thickness.

2.3 ACCESSORIES AND OTHER MATERIALS

A. Building Paper: Kraft paper; ASTM D227.

B. Sheet Metal Framing Anchors: Shall be as noted on the drawings.

C. Machine Bolts: ASTM A307.

D. Lag Bolts: ASME B18.2.1.

E. Nails:
1. Use **common nails** except as otherwise noted.
2. Comply with ASTM F1667. Minimum dimensions shall be as follows:

| Pennywt. | Shank Dia. | Head Dia. | Length |
|---|---|---|---|
| 8d | 0.131" ± .004" | 0.281" ± 10% | 2.5" ± 1/16" |
| 10d | 0.148" ± .004" | 0.312" ± 10% | 3.0" ± 3/32" |
| 16d | 0.162" ± .004" | 0.344" ± 10% | 3.5" ± 3/32" |

3. All nails for pressure treated or fire-retardant lumber shall be hot-dipped zinc-coated galvanized. Nails with other types of galvanizing may be used if pre-approved by the enforcement agency.

F. Fasteners and Anchors: Size, type, material as indicated and as recommended by applicable standards; unfinished, except as specified below.
1. In Preservative Treated Wood:
   a. Use Categories UC2 and UC3B: Hot-dip zinc coating, types and weights in accordance with the treated wood or anchor manufacturer; ASTM A153 or F2329.
   b. Use Category UC4A: Type 316L stainless steel.
2. In Exposed Exterior Conditions: Type 316L stainless steel.
3. In Concrete or Masonry: Mechanically deposited zinc coating; ASTM B695, Class 55 minimum.

G. Connectors and Hangers: Fabricate from steel with minimum ASTM A653 G90 zinc coating, thickness to suit framing conditions.
1. At Preservative Treated Wood:
   a. Use Categories UC2 and UC3B: Hot-dip zinc coating; ASTM A653, G185 minimum.
   b. Use Category UC4A: Type 316L stainless steel.
2. At Exposed Exterior Conditions: Type 316L stainless steel.

H. Construction Adhesives: Comply with VOC requirements of California Green Building Standards Code, Section 5.504.4.1.

2.4 FACTORY PRESERVATIVE TREATMENT

A. Lumber Above Grade: AWPA U1-14, Use Category UC2, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
2. Treat lumber in contact with masonry or concrete.
3. Treat lumber in other locations as indicated.

B. Lumber Exposed to Weather: AWPA U1-14, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.

1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
2. Treat lumber exposed to weather.

C. Lumber in Contact with Soil: AWPA U1-14, Use Category UC4A, Commodity Specification A using waterborne preservative to 0.4 lb/cu ft retention.
   1. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
   2. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

D. Plywood Above Grade: AWPA U1-14, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
   1. Kiln dry plywood after treatment to maximum moisture content of 15 percent.
   2. Treat plywood in contact with masonry or concrete.
   3. Treat plywood in other locations as indicated.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 COMPLIANCE

A. Do not permit materials not complying with the provisions of this Section to be brought onto or to be stored at the job site.

B. Promptly remove non-complying materials from the job site and replace with materials meeting the requirements of this Section.

3.3 WORKMANSHIP

A. Produce joints which are tight, true, and well nailed, with members assembled in accordance with the Drawings and with pertinent codes and regulations.

B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

C. Lumber Selection:
   1. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing, and will allow making of proper connections.
   2. Cut out and discard defects which render a piece unable to serve its intended function.
   3. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

D. **Do not shim any framing component unless specifically indicated on the drawings.**

3.4 GENERAL FRAMING

A. 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 by the Architect.

B. Bearings:
1. Make bearings full unless otherwise indicated on the Drawings.
2. Finish bearing surfaces on which structural members are to rest so as to give sure and even support.
3. Where framing members slope, cut or notch the ends as required to give uniform bearing surface.

C. Fire Blocks and Draft Stops: CBC Section 718.
1. **General:** In combustible construction, firestopping and draft stopping shall be installed to cut off all concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof or attic space, and shall subdivide attic spaces, concealed roof spaces and floor-ceiling assemblies. The integrity of all fire and draft stops shall be maintained.
2. **Fire Stops:** Provide firestopping in the following locations:
   a. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor levels and at 10'-0" intervals along the length of the wall.
   b. In fire sprinklered buildings having furred spaces without sprinklers, provide minimum 1/2" thick plywood fire stop so spaced (horizontally or vertically) to contain no more than 51 cubic feet of area. Coordinate with fire sprinkler installer.
   c. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings;
   d. In concealed spaces between stair stringers at the top and bottom of the run and between studs along and in line with the run of stairs if the walls under the stairs are unfinished;
   e. In openings around vents, pipes, ducts, chimneys, fireplaces and similar openings which afford a passage for fire at ceiling and floor levels, with noncombustible materials.
3. **Draft Stops:** Provide draft stopping at locations indicated on the drawings.

D. Furring, Stripping, Grounds, and Backing:
1. All wood furring, stripping, blocking, bucks and grounds shall be furnished and installed by the Contractor where required for support or backing for other materials whether shown or not on the drawings and/or these specifications. All pipes and ducts shall be furred in wherever shown.
2. Provide horizontal and vertical backing and blocking for nailing all joints at walls, parapets, ceilings, soffits, etc. finish materials shall be provided whenever needed throughout the building. Horizontal and vertical backing shall also occur at counter heights, wainscot heights and for securing all fixtures, cabinet work, shelving and all other items that require support from the wall.
3. Furnish and set all wood grounds for plastering, sheet metal and other trades. Grounds shall be of proper size and spacing for the installation of work as noted under the various headings.
4. All blocks, grounds, etc., which are embedded in concrete shall be dipped in creosote after being cut to size and after nails are driven which are to hold them in the concrete.

E. Plywood Installation:
1. Placement:
   a. Place plywood with face grain perpendicular to supports and continuously over at least two supports, except where otherwise shown on the Drawings.
   b. Center joints accurately over supports, unless otherwise shown on the Drawings.
   c. Stagger panel end joints.
2. Protect plywood from moisture by use of waterproof coverings until the plywood in turn has been covered with the next succeeding component or finish.
3. Installation of plywood shall comply with the requirements of CBC and the APA. If in conflict conform to CBC.

F. Nailing:
   1. Use only common wire nails or spikes of the dimension shown on CBC Table 2304.10.1 - Fastening Schedule, except where otherwise specifically noted on the Drawings.
   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" (nominal) thickness.
   3. Nail without splitting wood.
   4. Pre-bore as required.
   5. Remove split members and replace with members complying with the specified requirements.

G. Bolting:
   1. Drill holes 1/32" larger in diameter than the bolts being used.
   2. Drill straight and true from one side only.
   3. Do not bear bolt heads on wood, but use washers under head and nut where both bear on wood, and use washers under all nuts.

H. Lag Screws: Prebore holes to 40% to 70% of shank diameter at threaded portion, enlarging holes to shank diameter for length of shank.

I. Wood Screws:
   1. Preboring is not required but shall not exceed 7/8 x shank diameter and 7/8 x diameter of the screw at the root of the thread.
   2. Do not hammer screws into holes, soap may be used to facilitate insertion.

J. Sills and Plates:
   1. Install pressure preservative-treated lumber for plates and sills in conformance with CBC Section 2304.10.5.
   2. Bolt to foundations and slabs. Level sills with dry-pack, washers placed, and nuts tightened to level bearing.
   3. Pack space between sill and concrete with dry-pack cement grout.

**END OF SECTION 06 1100**

**SECTION 06 1600 - EXTERIOR CEMENTITIOUS BOARD**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide cementitious board systems and accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 06 1100: Rough carpentry.
3. Section 07 6200: Flashing and sheet metal.
4. Section 09 2420: Direct-Applied Exterior Finish System.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.

1.3 REFERENCES

A. All work shall be performed in accordance with the Drawings and Specifications, and with the following standards:
1. ANSI A118.9: Test Method Specification for Cementitious Backer Units.
2. ASTM C 954: Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch to 0.110 inch in Thickness.
3. ASTM C 1002: Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
4. ASTM C 1280: Standard Specification for Application of Gypsum Sheathing.
5. ASTM C 1325: Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
6. ASTM D 226: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
7. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E119: Test Method for Fire Tests of Building Construction and Materials.
9. ASTM E 1677: Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.
10. GA 253: Recommended Specification for the Application of Gypsum Sheathing.
11. ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
12. ASTM D3274: Standard Test Method for Evaluation Degree of Surface Disfigurement of Paint Films by Microbial Growth or Soil and Dirt Accumulation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. Materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the site.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 CEMENT BOARD

A. Cementitious Fiber-Mat Reinforced Sheathing: ASTM C1325; ANSI A118.9; sizes to minimize joints in place; 1/2" thick in all locations unless otherwise noted. DUROCK Brand Cement Board by United States Gypsum Company.

2.3 FASTENING DEVICES

A. Wood Framing: DUROCK Brand Wood Screws, 2-1/4" long with corrosion resistant coating.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install the cementitious backing board in accordance with the Drawings/specifications and the manufacturers recommendations.
   1. 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.
   2. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
   3. Coordinate wall 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.
   4. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

B. Walls:
   1. Install over wood or metal studs at 16" o.c.
   2. Precut board to required sizes and make necessary cut-outs.
   3. Fit ends and edges closely but not forced together. Install board abutting top of spacer strip. Stagger end joints in successive courses.

4. Install boards with a 3/8" gap where non-load-bearing construction abuts structural elements.
5. Install boards with a 1/4" gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
6. Fasten boards to studs at 16" o.c. spaced 8" o.c. with perimeter fasteners at least 3/8" but not more than 5/8" from ends and edges.

C Ceilings/Soffits:

1. Apply cementitious backing board to framing with long dimension across framing. Center end or edge joints on framing and stagger joints in adjacent rows. Edges or ends parallel to framing shall be continuously supported.
2. Fit ends and edges closely, but not forced together.
3. Fasten boards to steel farming with 1-1/4" steel screws spaced 6" o.c. with perimeter fasteners at least 3/8" but not more than 5/8" from ends and edges. If necessary, provide additional blocking to permit proper attachment.

3.3 CLEANING UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering cement board scraps and dust, and to prevent tracking material and joint finishing compound onto floor surfaces.

B. At completion of each segment of installation, promptly pick up and remove from the working area all scrap, debris, and surplus material of this Section.

**END OF SECTION 06 1600**

**SECTION 06 4000 - ARCHITECTURAL WOODWORK**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide architectural woodwork where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. Types of woodwork included are:
   1. Plastic covered casework.
   2. Wood casework.
   3. Laminated plastic countertops and splashes.
   4. Factory finished wood casework.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   2. Section 09 9100: Finishing of wood trim and casework.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
   3. Hardware Schedule: Submit schedule with product data sheets for each type of hardware used.
   4. Shop Drawings: Submit shop drawings in conformance with *NAAWS* Section 1 - Submittals. For further information refer to www.woodworkinstitute.com.
      a. First page shall bear the *Woodwork Institute Certified Compliance Label*.
      b. Shop drawings shall be provided in sufficient details to show fabrication, installation, anchorage, colors, and interface of the work of this Section with the work of adjacent trades.
   5. Samples: Submit four color chip samples of each proposed material in the correct color and finish.
   6. Before delivery to the job-site, the woodwork supplier licensees of the Woodwork Institute shall issue a *Certified Compliance Certificate* with the original submittals indicating the woodwork products furnished for this project and certifying that these products and their installation will fully meet all the requirements of the *NAAWS* grade or grades specified and the Contract Documents.

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
   1. Manufacturer's recommended cleaning procedures.

1.3 REFERENCES

A. Minimum standards for work within this section shall be in conformance with the Woodwork Institute.

B. North American Architectural Woodwork Standards (NAAWS).

1.4 QUALITY ASSURANCE

A. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, manufacture and install architectural woodwork in strict accordance with the *North American Architectural Woodwork Standards* for the grades specified. All woodwork shall be provided by a single source WI affiliate

manufacturer that is able to provide a WI *Certified Compliance Certificate*. If provisions for the grade specified are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.

B. Woodwork Institute Cabinet Design Series (CDS): Refer to Appendix A of the *North American Architectural Woodwork Standards.*
   1. CDS numbers have been used to identify the intended design of individual cabinet units.
   2. Dimensions indicated are for nominal outside dimensions and fabricators are permitted a ½" tolerance in length; no tolerance is permitted for depth and height.
   3. Modifications to the Woodwork Institute Casework Design Series are denoted by the letter "M" following the design number.
   4. Apply finished end panels or integral members on exposed ends of cabinets. Close gaps at wall-to-wall installations by filler panels not to exceed 1-1/2" in width.

C. Coordinate the locations required for solid blocking or backing.

1.5 WOODWORK INSTITUTE CERTIFICATIONS

A. Woodwork Institute Certified Compliance Program (CCP):
   1. Before delivery to the job-site, the woodwork supplier licensees of the Woodwork Institute shall issue a *Certified Compliance Certificate* with the original submittals indicating the woodwork products furnished for this project and certifying that these products and their installation will fully meet all the requirements of the *NAAWS* grade or grades specified and the Contract Documents.
   2. Non-licensees of the Woodwork Institute shall provide WI *Certified Tracking Acknowledgment* with the original submittals, that they have arranged for inspection by a WI Inspector after completion of fabrication and installation. If all conditions are found to be compliant, the inspector will issue a *Certified Compliance Certificate*, indicating the millwork products furnished for this project, and certifying that these products and their installation fully meet all the requirements of the grade or grades specified and the Contract Documents.
   3. Each elevation of woodwork and countertop shall bear a certified compliance label.
   4. In addition to the CCP requirements, the millwork fabricator and/or installer shall allow field inspection by a WI Representative.

B. CCP Costs: The millwork fabricator and/or installer shall pay all costs for certified compliance. Issuance of a Certified Compliance Certificate is a prerequisite for final acceptance.

C. Owner reserves the right to request and pay for additional inspections by a representative of the Woodwork Institute to determine that the work of this Section has been performed in accordance with the specified standards. In the event such inspection determines that the work of this Section does not comply with the specified requirements, immediately remove all non-complying items and replace them with items complying with the specified requirements, all at no additional cost to the Owner, and reimburse the Owner for the cost of the additional inspections.

D. Woodwork and/or installation determined to be non-compliant (and not corrected) will be rejected.

1.6 QUALIFICATIONS:

A. Contractors and their personnel engaged in the work shall be able to demonstrate successful experience with work of comparable extent, complexity and quality to that shown and specified.

B. Fabricator shall be a member/licensee in good standing of the Woodwork Institute.

C. Installer shall be a member/licensee in good standing of the Woodwork Institute.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600 and Woodwork Institute *Architectural Woodwork Standards,* latest edition.

B. Deliver all materials only when the area of operation is enclosed and plaster and concrete work is dry, and area is broom clean.

C. Work area shall be well ventilated and protected from direct sunlight, excessive heat, rain or moisture. Temperature shall be maintained between 60̊ and 90̊ F and relative humidity between 45% and 65%. The HVAC system shall be on and functioning.

1.8 SEQUENCING AND SCHEDULING

A. Coordinate all fabrication, delivery and installation work with the general contractor and other applicable trades.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 PLASTIC COVERED CASEWORK

A. Construction: Comply with *Architectural Woodwork Standards Section 10 - Casework*.
   1. Grade: Custom.
   2. Construction Style: Style A Frameless.
   3. Construction Type: Type I - Multiple self-supporting units rigidly joined together or Type II - Single length sections to fit access openings at the Contractor’s option.
   4. Door and Drawer Front Style: Flush Overlay.
      a. Let in 1/8” reveals for all institution hinges specified, unless otherwise noted.
   5. Door and Drawer Edge Type:
      a. Type A for flush doors and drawers.
      b. Type E for glass doors.
   6. Accessible Sink Cabinet (WI #154): Provide 1" minimum support at bottom edge of sink skirt. Provide 3" base width at freestanding leg of cabinet (refer to detail on the Drawings).
   7. Provide fillers at the tops of uppers, wall hung cabinets and full height cabinets to fill the void between the casework and the wall.

B. Cladding Materials:
   1. General:
      a. Laminate cladding: High-pressure plastic laminate; NEMA LD 3.
      b. Melamine overlay: Thermofused low-pressure melamine overlay.
   2. Exposed Surfaces:
      a. Horizontal surfaces: 0.050" laminate cladding.
      b. Vertical surfaces: 0.028" laminate cladding.
      c. Shelf, drawer, door and cabinet box edging: 3 mm solid-color PVC edging.
   3. Semi-Exposed Surfaces:
      a. Inside cabinet door surface: 0.028" laminate cladding.

b. Inside cabinet backs and sides: Melamine overlay.
c. Shelf tops and bottoms: Melamine overlay.
d. Drawer interior surfaces: Melamine overlay.
e. Shelf, drawer, door and cabinet box edging: 3 mm solid-color PVC edging.
f. All other locations: 0.028" laminate cladding.
g. Special Conditions: Clad backs and sides of cabinets in open knee spaces (i.e., handicap alcoves) with 0.028 laminate cladding to match exposed surface colors, unless noted otherwise.

4. Balance Sheets: Provide plastic laminate balance sheets of thickness required by manufacturer.
5. Colors:
   a. Laminate: As indicated on the drawings.
6. CBC Section 803.11: Laminated products factory-produced with a wood substrate shall comply with one of the following:
   a. The laminated product shall meet the criteria of CBC Section 803.1.1.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, as described in Section 5.8 of NFPA 286.
   b. The laminated product shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of CBC Table 803.13, in accordance with ASTM E84 or UL 723. Test specimen preparation and mountain shall be in accordance with ASTM E2579.
   c. Melamine: White.
   d. Shelf edging: Match shelf color for semi-exposed, match cabinet color for exposed.
   e. Door and drawer edging: Match plastic laminate color unless otherwise noted.
   f. Open bookcases: Match laminate on both exposed and semi-exposed surfaces.

## 2.3 LAMINATED PLASTIC COUNTERTOPS, SPLASHES

A. Grades: Comply with *North American Architectural Woodwork Standards Section 11 - Countertops*.
   1. Grade: Custom.

B. Cladding Materials: 0.050" horizontal high-pressure laminate; NEMA LD 3. If post formed laminate is used provide post form grade 0.42 laminate.
   1. CBC Section 803.11: Laminated products factory-produced with a wood substrate shall comply with one of the following:
      a. The laminated product shall meet the criteria of CBC Section 803.1.1.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, as described in Section 5.8 of NFPA 286.
      b. The laminated product shall have a Class A, B or C flame spread index and smoke-developed index, based on the requirements of CBC Table 803.13, in accordance with ASTM E84 or UL 723. Test specimen preparation and mountain shall be in accordance with ASTM E2579.

C. Tops and Splashes:
   1. Construction: Fully formed
   2. Front edge:
      a. 180 degree wrap Full Round (3/4" radius).
      a. Hardwood bullnose (3/4" radius).
      b. Exposed ends: Self-edge.
   3. Backsplash:
      a. Type: Integral cove.
      b. Top edge: Waterfall. Self-edge ends.
      c. Height: Minimum 4" unless indicated otherwise on the drawings.
   4. End Splash (where indicated):
      a. Type: Square butt joint.
      b. Top edge: Self-edge coped to backsplash with self-edge ends held short of front edge.

c. No end splash is required when countertop abuts a plastic laminate cabinet side, provide matching color seam sealant at joint.
d. End splash shall be installed on top of the countertop; butting the countertop to the end splash is not acceptable.

5. Splicing: Countertop splices shall be no closer than 48" from a sink.
6. Exposed Edges: All exposed edges including sink and utility cut-outs shall be sealed with an opaque waterproof sealant.

D. Colors: As indicated on the Drawings.

2.4 SHELVES

A. Shelf Thickness: Meet or exceed *North American Architectural Woodwork Standards Section 10 Material, Machining, and Assembly Rules:*
1. 50 psf load capacity for both fixed and adjustable shelves.
2. All shelve widths over 32” shall be constructed using 1” thick material.
3. Thickness of exposed shelves shall match the maximum required thickness of exposed shelves within the same room.

2.5 CABINET HARDWARE

A. Finish: US-26D finish where exposed unless otherwise specified.

B. Hardware Schedule:
1. Hinges: ANSI/BHMA A156.9 Grade 1, WI Grade 1; H08-9XG60 Institutional Hinge by Terry, or 370/450 Series Overlay Hinge by Rockford Process.
2. Doors & drawer pulls: Stanley #4483, Hafele #116.07.622; US 26D.
3. Door and drawer locks: National C8173/C8178, Olympus 100DR/200DW.
4. Regular Drawer slides: Full extension 100# rated, Accuride #7432.
5. File Drawer Slides: Full extension 100# rated, Accuride #3832.
6. Adjustable shelf clips: Hettich 016721 with locating pin, or Hafele 282.11.752 (with screw in each clip).
7. Wire Management Grommets: As manufactured by Doug Mockett & Co.
a. Round grommets: EDP Series 2-1/2" diameter plastic with flip-top cap.
b. Elongated grommets: King Kong Series with flip-top cap.
c. Corner grommets: EDP Series 2-1/2" diameter plastic with flip-top corner cap.
d. Color: Black.
8. Card Holder (CD-1): Brainerd Name Tag Holder, 2-1/2" x 1/2". Provide at each teacher mail slot.
9. Card Holder (CD-2): KV 701 Card Holder. Provide at each flat file drawer.
10. Flipper Door Slide: Accuride #1432 anti-rack cable system
11. Wardrobe hanger rod: Knape and Vogt KV660, length to fit. Wall supports; KV734 and KV735.
12. Magnetic Door Catch: All metal construction.

C. Key door and drawer locks alike by room. Provide a minimum of 6 keys per room. Key each room differently and provide 4 master keys.

2.6 COUNTERTOP SUPPORT BRACKETS

A. Unless otherwise specified, heavy duty workstation brackets: 1/8” steel construction, 1000 pound load rating per pair, texture powder coat finish, 18” x 18”. Secure to wall with 3/16” lag screws with 1.5” embedment into blocking.

B. Product: Item Number 72531 82 128 by US Futaba or approved equivalent.

2.7 STANDING AND RUNNING TRIM

A. Standards: Comply with *North American Architectural Woodwork Standards Section 6 - Interior and Exterior Millwork.*
B. Interior Trim for Transparent Finish:
   1. Grade: Premium.
   2. Species: White Oak.
   3. Shapes: As indicated on the Drawings.
   4. Finishes: As indicated on the Finish Schedule and as specified under Section 09 9100.
C. Interior Trim for Opaque Finish:
   1. Grade: Custom.
   2. Species: Maple or Birch.
   3. Shapes: As indicated on the Drawings.
   4. Finishes: As indicated on the Finish Schedule and as specified under Section 09 9100.

2.8 FABRICATION

A. Fabricate the work of this Section in strict accordance with the approved Shop Drawings and the WI construction requirements for the grade specified.

B. All toe space base boards shall be solid wood.

C. Construct bases with toe kicks as indicated on the Drawings at cabinet sides or ends.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Pre-installation Meeting: Meet at project site prior to delivery of architectural woodwork and review coordination and environmental controls required for proper installation and ambient conditioning in areas to receive work. Proceed with woodwork installation only when everyone concerned agrees that required ambient conditions can be maintained.

C. Verify adequacy and proper location of any required backing or support framing.

3.2 FIELD MEASUREMENTS

A. Take necessary measurements in the field to assure proper dimensions for the work of this Section.

3.3 INSTALLATION

A. Installation shall only occur after materials have been acclimatized for a minimum of 72 hours. NAAWS section 2.4.4.4.1 shall not apply.

B Install the work of this Section in strict accordance with the approved Shop Drawings and the referenced standards, anchoring all items firmly into position, as noted on Plans.

C. Install woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including tops); and with no variations in flushness of adjoining surfaces.

D. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
   1. Edges of cut-outs subject to moisture shall be sealed with an opaque waterproof sealant, before trim, sink, etc. are installed.

E. Cabinets:
   1. Install without distortion so that doors and drawers fit openings properly and are accurately aligned.
   2. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
   3. Maintain veneer sequence matching (if any) of cabinets.
   4. Provide felt silencers on backs of cabinet doors, minimum of 1 per door.
   5. Fill openings at tops of cabinets created by scribes and trim.

F. Tops:
   1. Anchor securely to base units and other support systems as indicated.
   2. **Laminate plastic countertop butt splices are critical. Use same production lots and prematch joints to minimize color variation.**

G. Standing and Running Trim:
   1. Install with minimum number of joints possible, using full length pieces from maximum length of lumber available.
   2. Stagger joints in adjacent and related members.
   3. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint.
   4. Scarf end-to-end joints.

3.4 INSPECTION

A. Schedule WI CCP Inspection with at least 7 days prior notice to planned installation start. Notify the Architect and Inspector of the day and time at least 48 hours prior to the inspection.

**END OF SECTION 06 4000**

## SECTION 07 0150 - PREPARATION FOR REROOFING

### PART 1 - GENERAL

1.1 SUMMARY

A. Remove existing roofing, base flashings, sheet metal flashings, vent stack flashings, rigid insulation, and perimeter nailers down to the deck in areas indicated on the Drawings. Sweep or clean all debris off of the deck.

1.2 ENVIRONMENTAL REQUIREMENTS

A. Do not remove existing roofing system or damaged decking when weather conditions threaten the integrity of the building contents or intended continued occupancy. Maintain continued temporary protection prior to installation of the new roofing system.

1.3 PROTECTION

A. It shall be the Contractor's responsibility to respond immediately to correction of roof leakage during construction. A 4 hour time limit shall be given from the time of notification of emergency conditions. In the event of water penetration during rain or a storm, the Contractor shall provide for repair or protection of the building contents and interior. If the Contractor does not respond or cannot be contacted, the Owner will affect repairs or emergency action and the Contractor shall be back charged for all expenses and damages, if any.

1.4 SCHEDULING

A. Schedule work to coincide with commencement of installation of new roofing system.

### PART 2 - PRODUCTS

2.1 MATERIALS

A. Temporary Protection: Sheet Polyethylene. Provide weights or fasteners to retain sheeting in position.

B. Base Sheet: ASTM D-4601 Type II. Provide weights or fasteners to retain sheeting in position.

### PART 3 - EXECUTION

3.1 EXAMINATION

A. Roofing Contractor to verify existing site conditions, including roof dimensions.

B. Verify that existing roof surface is clear and ready for work of the Section.

3.2 MATERIALS REMOVAL

A. Remove all gravel, membrane, cant strips, rigid insulation, expansion joints, base flashings, and any other items shown on the drawings. In addition, completely removal of all nails and other debris to leave a smooth, even surface for re-roofing.

B. Under certain conditions, it will be necessary and desirable to incorporate one or more of the following methods for removal of dirt, silt, gravel, debris, roof membrane, and insulation from the roof surface in order to preserve the ecology, eliminate unsightly conditions, and protect the building surfaces:
   1. Roof vacuum systems:
   2. Crane and hopper with dump truck system.
   3. Enclosed chutes with protective shrouds on the building and ground surfaces.

C. All debris dumped from the roof shall be transported from the roof via chutes into dumpsters or trucks, and this debris shall be removed from the premises when vehicles are full at the Contractors cost. No debris shall be transported from the area being worked on over a previously finished roof without an underlayment of 3/4" plywood.

D. All roof equipment not in use or left filled will be parked on the column lines on 3/4" plywood.

E. Contractor shall provide cut off (night tie in) at the end of each day's work. Area cut off shall be clean of all existing gravel.

F. Protect and preserve existing electrical conduit and electrical connections.

G. Remove all debris away from site to authorized disposal facilities.

3.3 TEMPORARY PROTECTION

A. Provide temporary protective sheeting over uncovered deck surfaces.

B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights or temporary fasteners.

C. Provide for surface drainage from sheeting to existing drainage facilities.

D. Do not permit traffic over unprotected deck surface.

3.5 PREPARATION

A. Verify that the deck is dry, sound, clean and smooth and free of depressions, waves, and projections. Cover all holes over 1" in diameter, cracks over 1/2" in width, loose knots and excessively resinous areas with sheet metal.

B. Replace damaged deck with new materials. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

**END OF SECTION 07 0150**

**SECTION 07 1310 - SHEET WATERPROOFING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide membrane waterproofing where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 31 2000: Earthwork.
3. Section 33 4610: Foundation drainage.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

A. Manufacturer: Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 10 years experience in the production and sales of self-adhesive sheet membrane waterproofing.

B. Installer: A firm which has at least 3 years experience in work of the type required by this section.

C. Materials: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.

D. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

1.4 SPECIAL WARRANTY

A. Manufacturer's Single-Source Warranty: Submit executed copy of manufacturer's material warranty for **5 years after date of Notice of Completion.**

B. Special Project Warranty: Upon completion of the Work and as a condition of its acceptance, deliver to the Architect two original copies of the following "Warranty and Maintenance Agreement", signed by the Contractor and the waterproofing subcontractor:
1. The undersigned hereby propose, and upon execution of this document by the Owner, agree for a period of 2 years after Substantial Completion of the Work to make immediate repairs as required to stop leaks or correct defects in the work of this Section, within 24 hours after receipt of notice from the Owner by telephone, telegram, or letter; and further agree to make such repairs without reference to or consideration of the cause or nature of such leaks or defects.

2. Repairs required within the stated period will be provided without cost to the Owner; except that repairs required consequent to an act of God, abuse, alterations, or failure of the substrata or the supporting structure (other than caused by defects in the work of this Section) will be paid for by the Owner promptly upon completion of the repair in each instance.
3. Repairs completed at Owner's cost shall be invoiced to the Owner at prevailing rates, and shall include an itemized breakdown of quantities plus unit cost for labor and materials, and shall include not more than 15% markup for overhead and profit.
4. This Warranty and Maintenance Agreement shall be in addition to the warranty requirements of the Contract Documents, and the enforcement of its provisions, shall not deprive the Owner of any action, right, or remedy otherwise available to him.

## PART 2 - PRODUCTS

### 2.1 MEMBRANE WATERPROOFING

A. Substitutions: Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Sheet Membrane Waterproofing System: Self-adhesive, cold-applied composite sheet consisting of a thickness of 1.4 mm of rubberized asphalt and 0.1 mm of cross-laminated, high density polyethylene film specially formulated for use with water-based surface conditioner. No special adhesive or heat shall be required to form laps.
   1. Bituthene System 4000 Membrane by Grace Construction Products.

C. Prefabricated Drainage Composite: Hydroduct 220 by Grace Construction Products.
   1. Drainage composite shall be designed to promote positive drainage while serving as a protection course.

D. Miscellaneous Materials: Surface conditioner, mastic, liquid membrane, tape and accessories specified or acceptable to manufacturer of sheet membrane waterproofing.

### 2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 PREPARATION OF SUBSTRATES

A. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.

B. Masonry Substrates: Apply waterproofing over concrete block with smooth trowel-cut mortar joints or parge coat.

C. Treat joints and install flashing as recommended by waterproofing manufacturer.

3.3 INSTALLATION

A. Apply surface conditioner at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of surface conditioner.

B. Delay application of membrane until surface conditioner is completely dry. Dry time will vary with weather conditions.

C. Seal daily terminations with troweled bead of mastic.

D. Apply drainage composite and related materials in accordance with manufacturer's recommendations.

E. Seal membrane terminations to substrate with termination bare and troweled bead of mastic.

**END OF SECTION 07 1310**

## SECTION 07 2100 - BLANKET INSULATION

## PART 1 - GENERAL

1.1 SUMMARY

A. Provide building insulation where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.

## PART 2 - PRODUCTS

2.1 BUILDING INSULATION MATERIALS

A. Fiberglass Insulation: Inorganic (non-asbestos) fibers formed with binders into resilient flexible blankets or semi-rigid batts; manufacturer's standard lengths and widths as required to coordinate with spaces to be insulated.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
1. Certain-teed Products Corp.
2. Johns Manville
3. Owens-corning Fiberglass Corp.
4. United States Gypsum Co.
5. FiberTek Insulation.
6. Substitutions: Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

C. Batt Width: Provide widths as required for flanged staple supported, nominal 16" or 24" for wood studs, or friction fit full 16" or 24" for metal studs, or cut to fit as required in other widths.

D. Support: Provide manufacturers recommended supporting systems as required for each installation. All insulation shall be continuously supported in a manner to permanently hold the insulation in place.
1. Wood framing shall be friction fit supported.
2. Metal framing shall be friction fit supported.
2. Support with RSA polypropylene biaxially oriented netting, 2-1/4" x 1-1/8" mesh.

2.2 INSULATION TYPES

A. Thermal Fiberglass Batts: ASTM C665, Type I.
1. Exterior walls concealed; R-19.

2. Exterior roof/ceiling concealed; R-30.
3. Flame spread - 25, smoke developed - 450; ASTM E84.
4. Combustion Characteristics: Pass; ASTM E136.
5. Recycled Content: Certified to contain minimum of 20% post-consumer and 5% pre-consumer recycled glass product, on average of manufacturer's products.

B. Sound Attenuation Fiberglass Batts: ASTM C665, Type I, full wall thickness.
1. Interior wall stud cavities, friction fit.
2. Flame spread - 25, smoke developed - 450; ASTM E84.
3. Combustion Characteristics: Pass; ASTM E136.
4. Recycled Content: Certified to contain minimum of 20% post-consumer and 5% pre-consumer recycled glass product, on average of manufacturer's products.

2.3 ACCESSORIES

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

C. Impaling Clips: Galvanized steel clips with washer retainer and clips, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Remove, or protect against, projections in construction framing which may damage or prevent proper insulation.

3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position.

B. Between Studs:
1. Install insulation tight in spaces and tight to exterior side of mechanical and electrical services with the plane of the insulation.
2. Leave no gaps or voids.
3. Trim insulation neatly to fit spaces.
4. Use wire or metal straps to hold insulation in place.

C. Between Wood Roof Rafters:
1. Install insulation tight in spaces and tight to exterior side of mechanical and electrical services with the plane of the insulation.
2. Leave no gaps or voids.
3. Trim insulation neatly to fit spaces.
4. Use wire or metal straps to hold insulation in place.

D. Between Wood I Joists: Wire up insulation under roof decks by running 16 or 18 gauge wire diagonally or perpendicular to the insulation every 18" to 24".

E. Underside of Roof Deck:
   1. Retain insulation batts in place with impaling clips at 12" on center. Secure impaling clips as recommended by manufacturer.
   2. Tightly abut adjacent insulation.

**END OF SECTION 07 2100**

## SECTION 07 2420 - DIRECT-APPLIED EXTERIOR FINISH SYSTEM

## PART 1 - GENERAL

1.1 SUMMARY

A. Provide direct-applied exterior finish system where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation. Section includes:
   1. Weather resistive barrier and spacers.
   2. Cementitious sheathing board.
   3. Direct-applied exterior finish.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 06 1100: Plywood sheathing.
   3. Section 07 6200: Flashing and sheet metal.
   4. Section 07 9210: Elastomeric joint sealants.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
   3. Samples:
      a. Submit samples of the proposed accessories.
      b. Provide 24" x 24" finish coat samples (on 1" foam board) of each plaster color and texture for approval by Architect 14 days prior to commencing work.

1.3 QUALITY ASSURANCE

A. Colors: Provide finish selections indicated in the Finish Schedule.
   1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
   2. Manufacturer’s Standard Colors and Finishes: Where Finish Schedule specifies a manufacturer’s standard color or finish, Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. Contractor shall be responsible for providing colors matching those indicated on the Drawings.
   3. Custom Colors: Where Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

B. Project Conditions:
   1. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are dry.
   2. Materials shall not be applied when wall or ambient temperatures are below 40 deg F.
   3. Application of finish coat shall be at a minimum ambient temperature for a minimum amount of time as recommended by the product’s manufacturer.
   4. If necessary, tenting, heating, and ventilation may be utilized to maintain required conditions. Heaters shall be vented to the outside.

5. Protect materials from uneven and excessive evaporation in warm windy weather.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equivalent or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 WATER-RESISTIVE BARRIER

A. Water-Resistive Barrier: Fully formulated, noncementitious, water-based material applied over approved substrates to provide water resistance and air barrier properties.
1. Dryvit Backstop NT or approved equivalent.

B. Grid Tape: 4) wide, open weave fiberglass mesh tape used to reinforce sheathing joints and exposed edges of sheathing.
1. Dryvit Grid Tape or approved equivalent.

C. Flashing Tape: 25 mil cold-applied, self-adhering, self-healing construction grade tape used to seal rough openings in walls.
1. Dryvit Flashing Tape or approved equivalent.

D. Flashing Tape Surface Conditioner: Water-based latex surface treatment that is to bind site dust and concrete efflorescence, thereby providing a surface more receptive to the adhesion of the flashing tape, for use when required due to site conditions.
1. Dryvit Flashing Tape Surface Conditioner or approved equivalent.

2.3 SPACERS

A. Spacers: A polyethylene spacer, which separates the exterior cement board from the sheathing substrate.
1. Dryvit MD Spacer or approved equivalent.

2.4 EXTERIOR CEMENTITIOUS BOARD

A. Cementitious Fiber-Mat Reinforced Sheathing: ASTM C1325; ANSI A118.9; sizes to minimize joints in place; 1/2" thick in all locations unless otherwise noted.
1. Durock Brand Cement Board by United States Gypsum Company or approved equivalent.

B. Fasteners:
1. Wood Framing: Durock Brand Wood Screws, 2-1/4" long with corrosion resistant coating.

2.5 BASE COAT

A. Base Coat: A liquid polymer based material, which is field mixed in a 1:1 ratio by weight with Portland Cement. Dryvit Genesis or approved equivalent.
1. Portland Cement, ASTM C150, Type I or II.
2. Water for Mixing Base Coat: Drinkable, free of substances capable of affecting plaster set or of damaging plaster, lath or accessories.

B. Reinforcing Mesh: Balanced open weave, glass fiber fabric treated for compatibility with other system materials.

1. At all exterior cement board joints and inside and outside corners. Dryvit Detail Mesh or approved equivalent.
2. Over the entire exterior cement board face. Dryvit Standard Mesh or approved equivalent.

2.6 FINISH COAT

A. Finish Coat: Water based, acrylic coating with integral color as indicated on the Finish Schedule and integral texture.
   1. Dryvit Sandblast DPR: Medium texture or approved equivalent.

2.7 METAL ACCESSORIES

A. General: All accessories shall be pure zinc alloy.

B. Casing Beads: Stockton Products CSB Casing Starter Bead, 3/4".

C. Control Joints: Clark Dietrich, Zinc Control Joint, #75 - 3/4".

D. Weep Screed: Stockton Products CSB Casing Starter Bead, 3/4", with weep holes.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Prior to installation of the direct-applied exterior finish system, it is the contractor's responsibility to ensure that:
   1. The gypsum sheathing substrate and the exterior cementitious board surface are free of dust, loose particles, oil and other conditions that would affect the adhesion or installation of the direct-applied exterior finish system materials.
   3. All fasteners are corrosion resistant and installed in a manner as to be flush with the surface of the cementitious board.
   4. All accessories including, control and expansion joints, casing beads, etc. are properly fastened and positioned according to contract drawings, manufacturer requirements and local building code requirements.
   5. The water-resistive barrier is of a proper type and in accordance with building code and manufacturer's requirements.
   6. Doors, windows, decks, and other openings and penetrations have been properly flashed in accordance with manufacturer requirements, building code and contract documents.
   7. Metal roof flashing has been installed in accordance with Asphalt Roofing Manufacturers Association (ARMA) Standards.
   8. The cement board surface is flat within 1/4" in 10'-0".
   9. The contractor shall notify the general contractor and/or owner and/or architect of all discrepancies. Do not proceed until unsatisfactory conditions are resolved.

B. Protection: The direct-applied exterior finish system materials shall be protected by permanent or temporary means from weather and other damage prior to, during, and following application, until dry.

3.2 WATER-RESISTIVE BARRIER INSTALLATION

A. Mixing: Water-resistive barrier materials shall be mixed in accordance with the manufacturer’s recommendations.

B. Application:
   1. Prepare the sheathing substrate so as to be free of foreign materials such as oil, dust, dirt, paint, wax, water repellents, moisture, frost and any other materials that may inhibit adhesion.
   2. Apply the water-resistive barrier in accordance with the manufacturer's recommendations.
   3. Apply the flashing tape in accordance with the manufacturer's recommendations.

C. Repair holes, tears or rips.

3.4 INSTALLATION OF METAL ACCESSORIES

A. Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated.
   1. Miter or cope accessories at corners; install with tight joints and in alignment.
   2. Attach accessories securely to bases to hold accessories in place and alignment during plastering.

B. Casing Beads: Install at termination of cementitious board work unless otherwise indicated.

C. Control Joints: Install control joints at locations indicated, or if not indicated, at locations complying with the following criteria and approved by the Architect. As a minimum, control joints shall be located at the following locations:
   1. Corners of openings.
   2. Such that wall lengths do not exceed 20'-0".
   3. Length to width ratios of wall areas shall not exceed 2.5:1.

D. Install accessories flush with metal frames and other built-in items unless otherwise indicated.

3.5 SPACER INSTALLATION

A. Secure the spacer to the substrate using corrosion resistant staples through the water-resistive barrier and into the substrate or framing in accordance with the manufacturer's written installation instructions.
   1. Install spacer in continuous vertical strips spaced a maximum of 16" on center over each framing member.
   2. Install the spacer flush with the vertical edge of all system terminations and changes in wall direction.

3.6 EXTERIOR CEMENTITIOUS BOARD

A. Install the cementitious backing board in accordance with the Drawings/specifications and the manufacturers recommendations.
   1. 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.
   2. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
   3. Coordinate wall 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.
   4. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

B. Walls:
   1. Install over wood or metal studs at 16" on center.
   2. Precut board to required sizes and make necessary cut-outs.
   3. Fit ends and edges closely but not forced together. Install board abutting top of spacer strip. Stagger end joints in successive courses.
   4. Align sheathing joints with the spacers and install fasteners through the spacers as needed.

5. Do not align joints with corners of wall penetrations.
6. Exterior cement board joints shall be offset from sheathing board substrate joints.
7. Install boards with a 3/8" gap where non-load-bearing construction abuts structural elements.
8. Install boards with a 1/4" gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
9. Fasten boards to studs at 16" o.c. spaced 8" on center with perimeter fasteners at least 3/8" but not more than 5/8" from ends and edges.

C Soffits:
1. Apply cementitious backing board to framing with long dimension across framing. Center end or edge joints on framing and stagger joints in adjacent rows. Edges or ends parallel to framing shall be continuously supported.
2. Fit ends and edges closely, but not forced together.
3. Fasten boards to steel farming with 1-1/4" steel screws spaced 6" o.c. with perimeter fasteners at least 3/8" but not more than 5/8" from ends and edges. If necessary, provide additional blocking to permit proper attachment.

3.7 BASE COAT INSTALLATION

A. Mixing: Base coat materials shall be mixed in accordance with the manufacturer’s recommendations.

B. Application: Apply the base coat materials in accordance with the manufacturer’s recommendations.

3.8 FINISH COAT INSTALLATION

A. Mixing: Finish coat materials shall be mixed in accordance with the manufacturer’s recommendations.

B. Application:
1. Allow base coat materials to cure a minimum of 24 hours until completely dry or as recommended by the manufacturer.
2. Ensure that the surface of the wall is clean, dry and free of any contaminants that may impair the adhesion of the finish.
3. Apply the finish coat materials in accordance with the manufacturer’s recommendations.
4. Apply finish coat to match mock-ups in color and texture.
5. Provide sufficient crew size to maintain a wet edge; scaffold lines shall be kept to a minimum.
6. Maintain consistency and uniformity in application procedures and techniques.
7. Leave adjacent surfaces clean and free of plaster materials.
8. Leave protection of the plaster in place until finish coat is set.
9. Repair scaffold tie-is to maintain water-resistance of plaster assembly and blend with finish coat.

C. Protect finish coat in compliance with manufacturer's recommendations.

3.9 CLEANING UP

A. In addition to other protection, protect and clean adjacent surfaces from the accidental application of finish system materials.

B. In addition to other requirements for cleaning, immediately upon completion of this portion of the Work visually inspect adjacent surfaces and remove all traces of spilled and splashed finish system materials.

**END OF SECTION 07 2420**

**SECTION 07 3110 - ASPHALT SHINGLES**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide and install asphalt roof shingles where indicated on the Drawings, as specified herein, and as required for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 07 6200: Sheet metal flashing and trim.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Selection Samples: For each finish product specified, two complete sets of tile colors representing manufacturer's full range of available colors and patterns.

1.3 QUALITY ASSURANCE

A. Installer Qualifications:
1. A single installer ("roofer") shall perform the work of this section; and shall be a firm with not less than 5 years of successful experience in installation of specified roofing systems similar to those required for this project and which is acceptable to or licensed by manufacturer of primary roofing materials.
2. Installer's Field Supervision: Installer must maintain full-time supervisor/foreman on job site during times that roofing work is in progress. Supervisor must have minimum of five year's experience in roofing work similar to nature and scope to specified roofing.

B. UL Listing: Provide specified roofing system and component materials which have been tested for application and slopes indicated and are listed by Underwriters' Laboratories, Inc. (UL) for Class A external fire exposure.
1. Provide roof covering materials bearing Classification Marking (UL) on bundle, package or container indicating that materials have been produced under UL's Classification and Follow-Up Service.

C. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturer’s specified in the Finish Schedule are for purposes of color matching only. Refer to this Specification Section for additional manufacturers.
2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that standard colors or finishes of other manufacturer’s (from the listing of acceptable manufacturers) will be acceptable. The Contractor shall be responsible for providing matching colors.

1.4 PRE-ROOFING MEETING

A. Not less than three nor more than ten calendar days prior to scheduled start of roofing installation, conduct a roofing substrata inspection and pre-roofing meeting at the job site.
1. Visually inspect all substrata upon which roofing is scheduled to be applied.
a. Determine general acceptability, and determine areas requiring further preparation.

b. Determine acceptable remedies for unacceptable areas.
2. Discuss proposed schedule for installation of the roofing, and reach agreement as to dates of start and finish of installation of the roofing.
3. Discuss product submittals and warranties.
4. Discuss interface with the work of other trades.
5. Discuss proposed methods for installation of the roofing, and equipment and personnel to be used.
6. Discuss inspection methods to be used.

1.5 SPECIAL WARRANTY

A. Manufacturer's Warranty: Submit executed copy of roofing manufacturer's standard "Limited Warranty" agreement, signed by an authorized representative of fiber glass shingle roofing system manufacturer, on form which was published with product literature as of date of Contract Documents, for **Limited Lifetime Warranty.**

B. Special Project Warranty: Upon completion of the Work and as a condition of its acceptance, deliver to the Architect two original copies of the following extended warranty, signed by the Contractor and the roofing subcontractor:
1. The undersigned hereby propose, and upon execution of this document by the Owner, agree for a period of 2 years after Substantial Completion of the Work to make immediate repairs as required to stop leaks or correct defects in the work of this Section, within 24 hours after receipt of notice from the Owner by telephone, telegram, or letter; and further agree to make such repairs without reference to or consideration of the cause or nature of such leaks or defects.
2. As a further condition of this 2-year Extended Warranty, the undersigned hereby agree to repair or replace any other damaged products and finishes damaged as a result of water penetration, to return the building to its original condition, and to notify the roof system manufacturer in writing within 30 days that such repairs were made.
3. Repairs required within the stated period will be provided without cost to the Owner; except that repairs required consequent to an act of God, abuse, alterations, or failure of the substrata or the supporting structure (other than caused by defects in the work of this Section) will be paid for by the Owner promptly upon completion of the repair in each instance.
4. Repairs completed at Owner's cost shall be invoiced to the Owner at prevailing rates, and shall include an itemized breakdown of quantities plus unit cost for labor and materials, and shall include not more than 15% markup for overhead and profit.
5. This Warranty shall be in addition to the warranty requirements of the Contract Documents and the enforcement of its provisions shall not deprive the Owner of any action, right, or remedy otherwise available to him.

**PART 2 - PRODUCTS**

2.1 ASPHALT SHINGLES

A. Self-sealing asphalt shingle with a fiberglass reinforced core and a mineral granule surfacing with architectural laminate styling for wood shake appearance.
1. Solar Reflective Index (SRI): 28 minimum.
2. Solar Reflectance (SR): 0.25 minimum.
3. UL 790 Class A rated.
4. Tested and labeled per ASTM D7158 or ASTM D3161.
5. ASTM D 7158, Class H.
6. ASTM D 3161, Class F.
7. ASTM D 3018, Type 1.
8. ASTM D 3462.
9. CSA A123.5.

B. Acceptable Products:
   1. Timberline® Cool Series Architectural Shingles by GAF.
   2. Landmark Solaris Gold Shingles by CertainTeed.
   3. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

C. Color: As selected by the Architect from the manufacturer's standard colors.

E. Solar Reflective Index: Minimum SRI of 75; or minimum solar reflectance of 0.63 and minimum thermal emmitance of 75.

2.2 UNDERLAYMENT

A. Membrane Underlayment: WIP 100 Granular-Surface Self-Adhering Roofing Underlayment by Carlisle, or approved equal meeting the requirements of ASTM D1970. At roofs with less than 4:12 slope (2:12 minimum) provide a second layer of underlayment as follows:
   1. Felt Underlayment: 30 lb., asphalt saturated, organic felt meeting the requirements of ASTM D226 Type II or ASTM 4869 Type IV.

2.3 OTHER MATERIALS

A. Hip and Ridge Shingles: High profile self-sealing hip and ridge cap shingle matching the color of selected roof shingle.

B. Starter Strip: Self-sealing starter course.

C. Asphalt Plastic Roofing Cement: ASTM D 4586, Type I or II.

D. 26 gauge galvanized "step flashing" at all curbs. Cover all step flashing with 22 gauge galvanized counter flashing.

E. Ice and Water Shield: Grace Ice & Water Shield where indicated at all curbs.

F. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Verify that the deck is dry, sound, clean and smooth and free of depressions, waves, and projections. Cover all holes over 1" in diameter, cracks over 1/2" in width, loose knots and excessively resinous areas with sheet metal.

3.2 UNDERLAYMENT INSTALLATION

A. Membrane underlayment shall be applied in accordance with CBC Table 1507.1.1(2). Install shingle fashion in strict accordance with the manufacturer's written instructions in valleys, continuous at roof ridge and eaves, at all roof penetrations (HVAC, plumbing, electrical), and other locations indicated. At roofs with less than 4:12 slope provide a second layer of underlayment. Install per manufacturers recommendations.

3.3 SHINGLE INSTALLATION

A. Install underlayment, shingles, flashing, and other accessories in accordance with written instructions furnished by the shingle manufacturer.

B. Nails:
1. Use hot galvanized steel or aluminum sharp pointed conventional barb shank roofing nails with 3/8" flat head 12 gauge shank, meeting the requirements of ASTM F1667.
2. Nails are to be sufficient length to penetrate 3/4" into solid decking or through plywood sheathing. Do not overnail. Drive the nail until the head nearly touches the surface of the shingle.
**3. NAILS MUST FALL INTO THE OVERLAP AREA OF SHINGLE LAMINATE.**
4. Not less than 4 nails per strip shingle or 2 nails per individual shingle per CBC section 1507.2.7.

**END OF SECTION 07 3110**

**SECTION 07 6200 - SHEET METAL FLASHING AND TRIM**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide flashing and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.
   1. The work includes patching of existing work.
   2. The work includes tying in of new work to existing work.

B. Types of flashing and sheet metal work include, but are not limited to:
   1. Metal wall and counter-flashings.
   2. Gutters, downspouts, and scuppers.
   3. Metal trim/fascia units.
   4. Miscellaneous sheet metal accessories.
   5. Sheet metal expansion joint systems.

C. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   2. Section 07 3110: Asphalt shingles.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Shop Drawings: Submit detailed drawings of layout, joining, profiles, terminations, and anchorages of fabricated work. Submit detailed drawings of special accessory components.
   2. Samples: Submit 3 samples, each approximately 12" square, in colors specified.

1.3 QUALITY ASSURANCE

A. In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of "Architectural Sheet Metal Manual" published by the Sheet Metal and Air-Conditioning Contractors National Association (SMACNA).

B. Standard commercial items may be used for flashing, trim, reglets and similar purposes provided such items meet or exceed the quality standards specified.

C. Colors: Provide finish selections indicated in the Finish Schedule.
   1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
   2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.
   3. Custom Colors: Where the Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.4 SPECIAL WARRANTY

A. PVDF (Polyvinylidene Fluoride) Coating Warranty: In addition to the warranty requirements of the Contract Documents, submit 2 original copies of coating applicator's 20-Year warranty. Warrant coating against peeling, blistering, chipping, checking, chalking in excess of a numerical rating of 8 when measured in accordance with ASTM D659, and fading and color change in excess of 5 NBS units when measured in accordance with ASTM D2244.2.

B. Special Project Warranty: Upon completion of the Work and as a condition of its acceptance, deliver to the Architect two original copies of the following Special Warranty, signed by the Contractor and the roofing subcontractor:
   1. The undersigned hereby propose, and upon execution of this document by the Owner, agree for a period of 2 years after Substantial Completion of the Work to make immediate repairs as required to stop leaks or correct defects in the work of this Section, within 24 hours after receipt of notice from the Owner by telephone, telegram, or letter; and further agree to make such repairs without reference to or consideration of the cause or nature of such leaks or defects.
   2. As a further condition of this 2-year Special Warranty, the undersigned hereby agree to repair or replace any other damaged products and finishes, to return the building to its original condition, and to notify the roof system manufacturer in writing within 30 days that such repairs were made.
   3. Repairs required within the stated period will be provided without cost to the Owner; except that repairs required consequent to an act of God, abuse, alterations, or failure of the substrata or the supporting structure (other than caused by defects in the work of this Section) will be paid for by the Owner promptly upon completion of the repair in each instance.
   4. Repairs completed at Owner's cost shall be invoiced to the Owner at prevailing rates, and shall include an itemized breakdown of quantities plus unit cost for labor and materials, and shall include not more than 15% markup for overhead and profit.
   5. This Special Warranty shall be in addition to the warranty requirements of the Contract Documents and the enforcement of its provisions shall not deprive the Owner of any action, right, or remedy otherwise available to him.

**PART 2 - PRODUCTS**

2.1 FLASHING MATERIALS

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Materials and Gauges: Where sheet metal is required, and no material or gauge is indicated on the Drawings, provide highest quality and gauge commensurate with the referenced standards. In no case shall sheet metal be less than 24 gauge.

C. Galvanized Steel Sheet Materials: ASTM A653, with G90 zinc coating; minimum 24 gauge except as otherwise indicated.

D. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gauge required for performance.

2.2 PREMANUFACTURED PARAPET COPING ASSEMBLIES

A. Coping Manufacturer: Subject to compliance with requirements, provide products by:
   1. R-Mer Edge Coping by Garland, 1-800-321-9336.

2. Perma-Tite Coping by Metal-Era, 1-800-558-2162.
3. Permasnap Coping by Hickman Engineered Systems, 1-828-676-1700.
4. Presto Lock Coping by Johns Manville, 1-800-445-1500.
5. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01620.

B. Performance Characteristics:
1. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-3 to positive and negative design wind pressure as defined by CBC Section 1504.5.
2. Coping sections shall expand and contract freely while mechanically locked in place on anchor cleats.
3. Coping sections shall lock to anchor cleats by mechanical pressure from support chairs.
4. All coping cover joints shall be underlayed with gutter/support chairs capable of draining water.

C. Materials:
1. Coping: Formed steel sheet, galvanized, 24 gauge thick, minimum; factory finish PVDF coating
2. Anchor Cleat: 20 gauge galvanized steel, 12” wide, with coping support; cleat spaced at 5'-0”on center minimum, mechanically fastened as indicated.
3. Concealed Splice Plates: Material and finish to match coping, 8 inch” wide, with factory applied dual non-curing sealant strips or formed water channels.
4. Fasteners: Stainless steel screw type with a minimum pull-out resistance of 240 #; no exposed fasteners permitted.

D. Fabrication:
1. Factory fabricated to sizes required.
2. Factory fabricated mitered and welded corners, end caps, and wall terminations.
3. Factory formed to radius and arch where indicated.

## 2.3 PREMANUFACTURED REGLET ASSEMBLIES

A. Reglet Manufacturer: Subject to compliance with requirements, provide products by:
1. Springlock Flashing and Reglets by Fry Reglet Corp.
2. Snap-Tite System by Mm Systems Corp.
3. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01620.

B. Materials:
1. Reglet: 24 gauge galavanized steel; ASTM A653 with G90 zinc coating.
2. Counter Flashing: 24 gauge galavanized steel; ASTM A653 with G90 zinc coating; factory prefinished.
3. Provide prefabricated prefinished inside and outside corners, sealed watertight.

## 2.4 FABRICATED FLASHINGS

A. Fascia: Fabricate profile as indicated, 24 gauge minimum thickness.
1. 6" wide concealed back-up plate, formed to exact profile of fascia and secure plate in place prior to installation.
2. Install continuous bead of sealant each side of joint and set fascia in place leaving 1/4" space between sections.

C. Exposed Gutters: Fabricate profile as indicted, 24 gauge minimum thickness.
1. Provide expansion joints with watertight joints.
2. Seal all joints with sealant.

D. Exposed Downspouts: Fabricate profile as indicted, 24 gauge minimum thickness.
   1. Provide strainers with outlet tubes.

H. Crickets: 22 gauge minimum thickness.
   1. Fabricate as indicated similar to SMACNA Figure 4-18, Detail 2.

I. Drip Edges: Fabricate as indicated, 24gauge minimum thickness.

K. Continuous Cleats: Form from same material as the unit which the cleat anchors, 20 gauge minimum thickness.

2.5 FINISHES

A. Factory Finish PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; 70% Kynar 500 resin or Hylar 5000 resin.
   1. 2-Coat Finish: Dry Film Thickness, ASTM D1400; 0.15 mil primer coat plus 0.70 mil color coat, 0.85 mil total minimum thickness.
   2. Color: As selected by Architect from the manufacturer's standard colors.
   3. Provide factory applied strippable plastic film for protection during fabrication and installation.

2.6 MISCELLANEOUS MATERIALS

A. Nails, Rivets, and Fasteners: Same metal as flashing/sheet metal or other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

B. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

C. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet

D. Roofing Cement: ASTM D 2822, asphaltic.

E. Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

F. Solder: For use with steel provide 50-50 tin/lead solder (ASTM B32), with rosin flux.

G. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.7 FABRICATION

A. General: Fabricate in accordance with the SMACNA Architectural Sheet Metal Manual.
   1. Form sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.
   2. Unless otherwise specifically permitted by the Architect, turn exposed edges back 1/2".
   3. Shop fabricate work to the greatest extent possible.

B. Fabricate and form work to fit substrates. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

C. Fabricate to shapes indicated in 10'-0" lengths except where shorter lengths are required by construction or sheet size.

D. Corners: Shop prefabricate interior and exterior turns, and other changes in direction using epoxy seam sealer and rivets to rigidly secure the assembly and render watertight.

## PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 WORKMANSHIP

A. General: Comply with manufacturer's written instructions and with SMACNA Architectural Sheet Metal Manual, 2003 Edition. Anchor units securely in place by methods indicated, providing for expansion of metal units; conceal fasteners where possible; and set units true to line and level. Install work with laps, joints, and seams which will be permanently watertight and weatherproof.
   1. Where lap seams are indicated, lap according to pitch, but not less than 3".
   2. Make flat and lap seams in the direction of flow.

B. Joints:
   1. Join parts with rivets or sheet metal screws where necessary for strength and stiffness.
   2. Provide suitable watertight expansion joints for runs of more than 40'-0", except where closer spacing is indicated on the Drawings or required for proper installation.

C. Separations:
   1. Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.
   2. Where sheet metal work will be in contact with masonry, concrete, or stone, evenly coat contact surfaces with non-sagging mastic. Where sheet metal work will be embedded in mortar joints, evenly coat both sides with non-sagging mastic.

D. Embedment: Embed metal in connection with roofs in a solid bed of sealant, using materials and methods described in Section 07 9210 of these Specifications or other materials and methods approved by the Architect.

3.3 CLEANUP

A. After completion, clean all exposed work of scraps, stains, and dirt. After cleaning, wash with clean water and wipe dry.

**END OF SECTION 07 6200**

**SECTION 07 8400 - FIRESTOPPING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide firestopping where shown on the Drawings, in all penetrations through fire rated walls, floors, and ceiling, and as specified herein, and as needed for a complete and proper installation. The Work of this Section includes, but is not limited to:
   1. Through penetration firestops and smoke stops for all fire-rated bearing and non-bearing wall and floor assemblies, both blank (empty) and those accommodating penetrating items such as cables, conduits, pipes, ducts, etc.
   2. Membrane penetration for fire-rated walls.
   3. Architectural/construction joint firestops within walls, floors, or the intersections of floors to exterior walls, or the intersection of top of walls to ceilings.
   4. Top of wall firestopping in all fire-rated partitions.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   2. Section 07 9210: Sealants and caulking.
   3. Section 22 0000: Plumbing.
   4. Section 23 0000: General Mechanical Provisions.
   5. Section 26 6000: General Conditions for Electrical Work.
   6. Section 27 0000: Communication Systems General.

C. Completely coordinate with work of all other trades.

D. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure and complete installation.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturers recommended installation procedures.
   3. UL Tested Systems: Submit drawings showing typical installation details for the methods of installation. Indicate which firestop materials will be used and thickness for different hourly ratings. Indicate construction of wall or floor assemblies, size, F-rating, T-rating, and remarks.
   4. Engineering Judgements: Submit manufacturer's drawings for all non-standard applications where no UL tested system exists. Indicate the "tested" UL system upon which the judgement is based so as to assess the relevance of the judgement to some known performance.

1.3 PERFORMANCE REQUIREMENTS

A. Firestopping Systems (Materials and Design):
   1. Conform to both Flame (F) and Temperature (T) ratings as determined by tests conducted in accordance with ASTM E814 in a configuration that is representative of field conditions.
   2. F ratings shall be a minimum of 1-hour but not less than the fire resistive rating of the assembly being penetrated.
   3. T ratings shall be based on measurement of the temperature rise on penetrating item(s).

B. Firestopping materials and systems shall be capable of closing or filling through-openings created by:
   1. The burning or melting of combustible pipes; cable jacketing, or pipe insulation materials, or;
   2. Deflection of sheet metal due to thermal expansion (electrical and mechanical ductwork).

C. Firestopping shall be flexible, allowing for normal pipe movement and shall not shrink upon drying as evidenced by cracking or pulling away from contact surfaces.

D. Firestopping shall be moisture resistant and shall not dissolve in water after curing.

E. Penetrations containing loose electrical, data, or communications cabling shall be protected using firestopping systems that allow unrestricted cable changes without damage to seal.

F. Materials shall not require ampacity derating in power cable installations.

**PART 2 - PRODUCTS**

2.1 FIRESTOPPING MATERIALS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
   1. 3M Ceramic Materials
   2. Tremco
   3. Morgan Thermal Ceramics
   4. USG
   5. RectorSeal Corp.
   6. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Wall, Floor, and Ceiling Penetrations: ASTM E814.
   1. Provide systems designed specifically for the penetration condition, materials, and required fire rating.
   2. Through-penetration fire stops may be used for membrane penetrations.
   3. The F rating shall apply to all through-penetrations and shall not be less than the required fire-resistance rating of the assembly penetrated.
   4. The T rating shall apply to those through-penetration location required to have T ratings as specified in CBC Sections 714 and shall not be less than the required fire-resistance rating of the assembly penetrated.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Verify that all pipe, conduit, cable, and other items which penetrate fire-rated construction have been permanently installed prior to installation of firestops.

3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the original design, requirements of governmental agencies having jurisdiction, and the manufacturers recommended installation procedures to comply with the designated and required firestop rating.

B. Conditions Requiring Firestopping:
   1. General: Provide firestopping for conditions specified whether or not firestopping is indicated, and if indicated, whether such material is designed as insulation, safing, or otherwise.
   2. Through-Penetrations: Install firestopping in all penetrations and in the annular space in all penetrations in any bearing or non-bearing fire-rated barrier.
   3. Membrane-Penetrations: Where required by CBC Section 714, protect all membrane-penetrations in rated walls with firestopping.
   4. Construction Joints/Gaps: Provide firestopping:
      a. Between the edges of floor slabs and exterior walls.
      b. Between the tops of walls and the underside of floors.
      c. In the control joints in masonry walls and floors.
      d. In expansion joints.

C. Dam Construction: When required to properly contain firestopping materials within openings, damming or packing materials may be utilized. Combustible damming material shall be removed after appropriate curing. Noncombustible damming materials may be left as a permanent component of the firestop system.

**END OF SECTION 07 8400**

**SECTION 07 9210 - JOINT SEALANTS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Throughout the Work, seal and caulk joints where shown on the Drawings and elsewhere as needed to provide a positive barrier against passage of moisture and air.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 03 3000: Cast-In-Place Concrete.
3. Section 09 9100: Painting.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Samples: Submit samples of each sealant, each backing material, each primer, and each bond breaker proposed to be used. Provide minimum of 4 samples of each manufacturers standard color for each application. Provide sample of each installation type for Architect approval prior to beginning installation. Repeat samples until acceptable installation is approved by the Architect.

1.3 QUALITY ASSURANCE

A. Rejection of Installed Caulking and Sealants: Indication of lack of skill on the part of installers shall be sufficient grounds for rejection of installed caulking and to require its immediate removal and complete re-caulking at no additional cost to the Owner.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. Do not retain at the job site material which has exceeded the shelf life recommended by its manufacturer.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Comply with VOC requirements of California Green Building Standards Code, Sections 5.504.4.1 and 5.504.4.2.

2.2 SEALANTS AND CAULKING

A. Silicone Sealant:
1. White Mildew Resistant: 786 White by Dow Corning, Sanitary 1700 White by General Electric, 863 White by Pecora.
2. General Exterior: 791 by Dow Corning, Silpruf by General Electric, 864 by Pecora, Spectrum 2 by Tremco.

B. Polyurethane Sealant:
1. General Use: DynaTrol II by Pecora, Dymeric by Tremco, Sikaflex-2c,NS/SL by SIKA.
2. Self-leveling Type: NR-201 by Pecora, Sonalastic SL1 by Sonneborn, Sikaflex 1cSL by Sika.

C. Acrylic Latex Sealant: AC-20+ Silicone by Pecora, Sonolac by Sonneborn.

D. Colors: Colors for each sealant installation will be selected by the Architect from standard colors normally available from the specified manufacturer.
1. In concealed installations use standard gray or black sealant.
2. Provide black sealant at glazing pockets.

2.3 ACCESSORY MATERIALS

A. Primers: Non-staining type, recommended by manufacturer to suit application.

B. Back-up Materials: Non-absorbent, non-staining, and specifically recommended for application by sealant manufacturer.

C. Bond Preventative Materials: Pressure sensitive tape recommended by sealant manufacturer to suit application.

D. Masking Materials: Appropriate masking tape which will effectively prevent application of sealant on surfaces not scheduled to receive it, removable without damage to substrate or staining.

E. Joint Cleaner: Non-corrosive, non-staining type recommended by sealant manufacturer; compatible with joint forming materials.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work will be performed. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Prepare all surfaces to receive sealants and caulking in strict accordance with the manufacturer's written requirements. Use solvents and primers where recommended by the manufacturer.

B. Clean all concrete joints, full depth free of debris and dust.

3.3 INSTALLATION

A. Install joint backing to achieve a neck dimension of no greater than 1/3 the joint width. Install in strict accordance with the manufacturer's written instructions.

B. Install bond breaker where joint backing is not used.

C. Mask adjacent surfaces to prevent contact of sealant with adjoining surfaces which would be stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape after tooling without disturbing joint seal.

D. Install sealant to manufacturer’s instructions.

E. Measure joint dimensions and size materials to achieve required width/depth ratios.

3.4 PRODUCT USAGE BY LOCATION

A. Where more than 1 type of sealant is listed, the Contractor may use either listed product that is best suited in accordance with the sealant manufacturer's written recommendations for the joint location and type and the surfaces to be sealed with particular attention given to prevent staining. Provide sealants and caulking as follows:
   1. Exterior, general use: Polyurethane or Silicone.
   2. Interior, wet areas: Mildew Resistant Silicone.
   3. Interior, general use and painting: Acrylic latex.
   4. Expansion and control joints, vertical and overhead surfaces: Polyurethane or Silicone.
   5. Expansion and control joints, horizontal surfaces: Self-leveling Polyurethane.
   6. Interior concrete slab (where slab is finished floor, fill all crack control joints): Polyurethane.
   7. Exterior concrete walks and courts (where indicated on the plans): Polyurethane.
   8. Horizontal surfaces, traffic: Self-leveling Polyurethane.
   9. Glazed tile and/or masonry: Polyurethane or Silicone.
   10. Plumbing fixtures: Mildew Resistant Silicone.
   11. Glazing to metal frame: Black Silicone.

3.5 CLEANING AND REPAIRING

A. Clean adjacent soiled surfaces.

B. Repair or replace defaced or disfigured finishes caused by sealant work.

**END OF SECTION 07 9210**

## SECTION 08 1110 - HOLLOW METAL DOORS AND FRAMES

### PART 1 - GENERAL

1.1 SUMMARY

A. Provide hollow metal doors, and hollow metal door and window frames, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 08 7100: Hardware requirements and templates.
3. Section 08 8100: Glass for vision panels, sidelights, and windows.
4. Section 09 9100: Field Painting

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Shop Drawings: Submit details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.

1.3 QUALITY ASSURANCE

A. Provide all products of this Section from a single manufacturer.

B. Comply with ANSI/SDI A250.8-2003 and HMMA 861-14.

### PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. Steelcraft, (805) 837-4111.
2. Stiles Custom Metal, Inc., (209) 538-3667.
3. Ceco Door Products, (510) 489-1700.
4. Curries, (559) 432-5537.
5. Security Metal Products, (310) 641-6690.
6. Metal Manufacturing Co., (916) 922-3484.
7. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 METAL DOORS

A. Exterior Flush Doors:
1. ANSI/SDI A250.8, Level 3, Model 2 (seamless), minimum 16 gauge (0.067") faces.
2. Top Closure: 16 gauge flush end channel closure with seal against moisture entry.

3. Bottom Closure: 16 gauge recessed end channel with drainage openings.
4. Galvanizing: Hot-dipped zinc coating; ASTM A653 with A60 or G60 coating.
5. Reinforce doors internally with 18 gauge steel hat section ribs.
   a. Weld reinforcing to each door face with spot welds to faces spaced 4" on center.
   b. Ends of ribs welded together full width of the supporting web span.
   c. Insulate space between ribs with 2 lb. density polyurethane bonded to both faces; ASTM C591.
6. Reinforce for finish hardware provided under Section 08 7000; ANSI/SDI A250.8.

B. Exterior Stile-and-Rail Doors: Unitized, true tube type construction with joints continuously welded and ground smooth.
1. ANSI/SDI A250.8, Level 3, Model 3, minimum 16 gauge (0.067") faces.
2. Core: 2 lb. density polyurethane bonded to both faces; ASTM C591, U-factor of 0.10.
3. Top Closure: Flush end channel closure with seal against moisture entry.
4. Bottom Closure: Recessed end channel with drainage openings.
5. Galvanizing: Hot-dipped zinc coating; ASTM A653 with A60 or G60 coating.
6. Reinforce for finish hardware provided under Section 08 7000; ANSI/SDI A250.8.

C. Interior Doors: Full flush or stile-and-rail design as indicated.
1. ANSI/SDI A250.8, Level 3, Model 2 (seamless), minimum 16 gauge (0.053") faces.
2. Core: 2 lb. density polyurethane bonded to both faces; ASTM C591, U-factor of 0.10.
3. Galvanizing: Hot-dipped zinc coating; ASTM A653 with A60 or G60 coating.
4. Reinforce for finish hardware provided under Section 08 7000; ANSI/SDI A250.8.

D. Finish:
1. After fabrication, fill all tool marks and surface imperfections, sand and dress smooth.
2. Grind, fill, and dress all weld joints.
3. Coat surface with factory primer for field finishing; ANSI/SDI A250.10.

2.3 METAL FRAMES

A. Type and Design:
1. Provide frames in the dimensions and types shown on the Drawings, non-labeled or labeled as indicated, in 16 gauge (0.053") for interior frames and 14 gauge (0.067") for exterior frames.
2. Galvanizing: Hot-dipped zinc coating; ASTM A653 with A60 or G60 coating.
3. **Face welded construction.**
4. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.
5. Reinforce for finish hardware provided under Section 08 7000; ANSI/SDI A250.8.
6. Frames Wider than 48": Reinforce with steel channel fitted tightly into frame head, flush with top.
7. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.

B. Finish:
1. After fabrication, fill all tool marks and surface imperfections, sand and dress smooth.
2. Grind, fill, and dress all weld joints.
3. Coat surface with factory primer for field finishing; ANSI/SDI A250.10.
4. Remove all areas of rust to bare metal; reprime prior to finish paint.

C. Frame Anchors:
1. Wood Stud Anchor: 18 gauge galvannealed steel, "lock-in" type.
2. Closed Metal Stud Wall Anchor: 18 gauge galvannealed steel, "lock-in" or factory welded type.
3. Wire Masonry Anchors: 3/16" diameter wire, "lock-in" type.
4. Masonry T-Anchors: 18 gauge galvannealed steel, "lock-in" type.
5. Existing Wall Anchor: 18 gauge galvannealed steel, "lock-in" or factory welded type.

6. Base Anchor: 16 gauge galvannealed steel, welded-in or adjustable; provide a minimum of 2 fasteners in each anchor.
7. Mullion Base Anchor: 16 gauge galvannealed steel, mullion slides over; provide a minimum of 2 fasteners in each anchor.
8. Corner Post Base Anchors: 12 gauge galvannealed steel, corner post slides over; provide a minimum of 2 fasteners in each anchor.

2.4 FINISH HARDWARE

A. Coordinate anchorage hardware and secure templates from the finish hardware supplier.

2.5 ACCESSORIES

A. Removable Glazing Stops (at window frames only):
1. Formed 20 gauge (0.032") sheet steel, butted corners; secured to frame with countersunk #6 zinc-coated tamper-proof screws.
2. Chemically treat and paint with a rust inhibitive primer all metal surfaces to which glazing stops are secured and the inside of the glazing stops to installation.

B. Glazed Light Frames:
1. 20 gauge (0.042") cold rolled steel frame, tightly mitered corners. At exterior locations, provide galvanized frames. Locate screws on room side.
2. Provide labeled frames at fire rated assemblies.
3. Finish: Factory baked enamel; custom color as selected by the Architect.
4. Model LoPro (LoPro-IS where required due to glazing thickness) by Anemostat or approved equal.

2.6 PREPARATION FOR HARDWARE

A. Coordinate anchorage hardware and secure templates from the finish hardware supplier.

B. Reinforcement: Reinforce components for hardware installation in accordance with ANSI/SDI A250.8 except where more stringent requirements are called for within this specification.
1. Provide box or channel type lock and closer reinforcements, continuous from top to bottom of door and welded to face sheets.

C. Punch single leaf frames to receive 3 silencers; provide one silencer per leaf at the head of double leaf frames unless gasketing is specified for that specific opening.

D. Factory prepare hardware locations in accordance with Section 08 7100.

E. Plaster Guards: 26 gauge galvanized steel plaster/dust guards, welded to frame at finish hardware cutouts where mortar, plaster, dust or other materials might obstruct hardware operation and to close off interior of openings.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FIRE RATED ASSEMBLIES

A. Install fire-rated doors and frames in accordance with their listings and NFPA 80.
   1. Install smoke and draft control doors in accordance with NFPA 105.

3.3 FRAME INSTALLATION

A. Install frames and doors in accordance with the manufacturer's written recommendations and ANSI/SDI A250.8.

B. Set welded frames in position prior to beginning metal stud partition work; brace frames until permanent anchors are set.

C. Set anchors for frames as work progresses. Install anchors at hinge and strike levels. Place frames prior to construction of enclosing walls and ceilings; provide minimum 3 anchors per jamb at hinge and strike locations.
   1. Where indicated in the plans, secure frames in place with screw fasteners at frame anchors to wall framing or post-installed expansion anchors at masonry and concrete. Countersink fasteners, fill with body putty, sand smooth and flush with no voids or ridges. Conceal installed fasteners so as to be invisible at exposed faces.

D. Set frames accurately into position, plumbed (within 1/8" in 10'), aligned, and braced securely until permanent anchors are set.
   1. Use temporary setting spreaders at all locations. Use intermediate spreaders to assure proper door clearances and header braces for grouted frames.

3.4 DOOR INSTALLATION

A. Install doors per manufacturer's recommendation.

B. Install hollow metal doors in frames using hardware specified in Section 08710 Finish Hardware.

C. Clearances at edge of doors.
   1. Between door and frame at head and jambs: 1/8".
   2. At meeting edges pairs of doors and at mullions: 1/8".
   3. At sills without thresholds: 5/8" maximum above finish floor.
   4. At sills with thresholds: 1/8" above threshold.

3.5 ADJUST AND CLEAN

A. Remove dirt and excess sealants, mortar or glazing compounds from exposed surfaces.

B. Final Adjustments: Adjust moving parts for smooth operation.
   1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.
   2. Leave work in complete and proper operating condition.
   3. Remove defective work and replace with work complying with the specified requirements.

C. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touchup of compatible air-drying primer submitted by the manufacturer.

D. Fill all dents, holes, etc. with metal filler, sand smooth and flush with adjacent surfaces - reprise and paint to match specified finish.

**END OF SECTION 08 1110**

**SECTION 08 1400 - WOOD DOORS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide wood doors where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications
2. Section 08 1110: Hollow metal doors and frames.
3. Section 08 7100: Hardware requirements.
4. Section 09 9100: Field finishing of wood doors and metal vision panel frames and door louvers.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Submit door manufacturer's technical data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.
4. Samples: Submit 12 samples, (6 to be submitted to painter for finish samples), approximately 8" x 8" in size, of each of the proposed door face materials representing typical range of color and grain for each species of veneer required.

1.3 QUALITY ASSURANCE

A. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with:
1. "Manual of Millwork" of the Woodwork Institute, for the grade or grades specified.

B. Manufacturer: Obtain doors from a single manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. Delivery:
1. Deliver doors to the job site after plaster and cement are dry, and after the building has reached average prevailing humidity of its locality.
2. Deliver prefinished doors in manufacturer's original containers, clearly marked with manufacturer's name, brand name, size, thickness, and identifying symbol on the covering.
3. Seal all four edges of unfinished doors when delivered to the job site.

C. Storage:
1. Stack flat on 2" x 4" lumber, laid 12" from ends and across center.
2. Under bottom door and over top and sides of stack, provide plywood or corrugated cardboard to protect door surfaces.

3. Store doors in area where there will be no great variations in heat, dryness, and humidity.

D. Do not drag doors across one another; lift doors and carry them into position.

1.5 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, provide 2 original copies the manufacturer's written **Lifetime Warranty.**

**PART 2 - PRODUCTS**

2.1 GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Provide flush wood doors of the types, designs, and thicknesses shown on the Door Schedule in the Drawings, labeled or non-labeled as indicated and required, and in solid core or hollow core as shown on the Door Schedule.

C. Grade: Except as may be shown otherwise on the Drawings, fabricate the work of this Section to "PREMIUM GRADE" standards of the referenced WI, Door Face Characteristics.

D. Plastic Laminate Veneer:
1. Grade: Premium
2. Laminate Face: High-pressure decorative laminate complying with NEMA LD 3, Grade HGS.
3. Stiles: Plastic-laminate matching faces, applied before faces.
4. Refer to Door and Finish Schedules for colors, patterns, and finishes.

2.2 INTERIOR WOOD DOORS

A. Non-Rated Solid Core Doors: Flush, 5-ply, 1-3/4" thick, 1-1/4" laminated hardwood stiles, 1-1/4" softwood rails and lock blocks, crossbanded 1/16" thick minimum, with particleboard core complying with ANSI A208.1, Grade LD-2.
1. Architectural Solid Core (APC-3) by Haley.
2. Particleboard Door by Eggers Industries.
3. Particleboard Core Door (DPC-1) by Weyerhaeuser.
4. Particleboard Door by Pacific Architectural Wood Products.
5. Flush Wood Veneer Doors (PC-5 or SCLC) by VT Industries.
6. GPD-PC Architectural Door by Graham Wood Doors.

2.3 FABRICATION

A. Openings: Cut and trim openings through doors to comply with applicable requirements.

B. Provide proper blocking for every surface applied piece of hardware. No sex bolt or through bolt application of hardware will be allowed.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Fitting and Machining:
   1. Unless doors are completely fitted and machined at the mill, fit them for width by planing and fit them for height by sawing:
      a. Bottom: 1/2" clearance maximum.
      b. Top: 1/8" clearance maximum.
      c. Lock edge and hinge edge: Bevel 1/8" in 2" maximum.
   2. Machine doors for hardware in accordance with recommendations of the hardware manufacturers, as those recommendations have been approved by the Architect.
   3. Seal cut surfaces after fitting and machining.

B. Install doors to comply with manufacturer's written instructions and referenced WIC standards.

C. Replace or rehang doors which are hinge bound and do not swing or operate freely.

3.3 COMPLIANCE

A. The Owner reserves the right to request and pay for an inspection by a representative of the referenced organization to determine that the work of this Section has been performed in accordance with the specified standards.

B. In the event such inspection determines the work of this Section does not comply with the specified requirements, immediately remove the non-complying items and replace them with items complying with the specified requirements, all at no additional cost to the Owner, and reimburse the Owner for the cost of the inspection.

**END OF SECTION 08 1400**

## SECTION 08 3100 - ACCESS DOORS

## PART 1 - GENERAL

1.1 SUMMARY

A. Provide ceiling and soffit access door where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturer's recommended installation procedures.

1.3 EXTRA MATERIALS

A. Keys: Provide for the Owner's use, 1 complete set of all tools and keys for each door that come packaged with the doors. Provide identification tag with each door key indicating key location.

B. Deliver keys to the Inspector of Record. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

## PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 CEILING/SOFFIT ACCESS DOORS

A. Non-Rated Flush Ceiling / Soffit Access: Access units with flanged frame flush with gypsum board and plaster ceilings and soffits:
   1. Construction: 14 gage steel door and flanged frame.
   2. Finish: Factory primed for painting on the job site.
   3. Locking: Provide each unit with cylinder locks and two keys per unit.
   4. Size: 22" by 36".
   5. Acceptable products:
      a. Model TM by J.L. Industries.
      b. Model DSC-214M by Karp Associates.
      c. Model L-DW by Larsen's Manufacturing.
      d. Style M by Milcor.
      e. Model NT by Nystrom.
      f. UF-5000 by Acudor Access Doors.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the manufacturers' recommendations as approved by the Architect, anchoring all items firmly into position for long life under hard use.

C. Put operating components through at least five complete operating cycles, adjusting as required and achieving optimum ease of operation.

**END OF SECTION 08 3100**

# SECTION 08 4110 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Provide aluminum storefront and entrance system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation, including perimeter trims, stools, accessories, shims and anchors, flashings and perimeter sealing of storefront and entrance units.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 08 8100: Glazing.

### 1.2 SUBMITTALS

A. Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturers recommended installation procedures.
   3. Shop Drawings: Submit shop drawings, including wall elevations at 1/4" scale, and full size detail sections of every member.
      a. Show anchors, hardware, operators, and other components not included in manufacturer's standard data.
      b. Provide sufficient detail to show fabrication, installation, anchorage, provisions for expansion and contraction, glazing details, and interface with the work of adjacent trades.
   4. Finish Samples: Provide 3 samples of each type of product section and exposed finish required in manufacturer’s standard sizes.
   5. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" lengths of full-size components and showing details of joinery and glazing.
   6. Informational Submittals: Submit certified test reports showing compliance with specified performance characteristics.

### 1.3 DEFINITIONS

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

### 1.4. PERFORMANCE REQUIREMENTS

A. Entrance Performance Requirements:
   1. Air Infiltration: ASTM E283; pressure differential of 6.24 psf for single doors and 1.567 psf for pairs of doors; single 3'0" x 7'0" entrance door and frame shall not exceed 0.50 cfm/sf; pair of 6'0" x 7'0" entrance doors and frame shall not exceed 1.0 cfm/sf.
   2. Structural: Test corner strength per the Kawneer dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner integrity.

B. Storefront Performance Requirements:
   1. Wind Loads: Provide storefront systems, including anchorage, capable of withstanding wind-load design pressure of 35.2 psf.
   2. Air Infiltration: ASTM E283; air infiltration rate shall not exceed 0.06 cfm/sf at a static air pressure differential of 6.24 psf.

3. Water Resistance: ASTM E331; no leakage as defined in the test method at a static air pressure differential of 8 psf as defined in AAMA 501.
4. Uniform Load Deflection: ASTM E330; minimum static air pressure difference of 20 psf shall be applied in the positive and negative direction; There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

C. Energy Performance:
1. Maximum U-factor: 0.47.
2. Maximum Relative Solar Heat Gain Coefficient: 0.26.
3. Minimum Visible Transmittance: 0.46.
4. Condensation Resistance: AAMA Specification 1503; condensation resistance factor shall not be less than:
a. Glass: 69.
b. Frame: 60.

D. Sound Transmission: Provide glazed aluminum curtain walls with fixed glazing and framing areas having the sound-transmission characteristics of STC-31 when tested for laboratory sound transmission loss according to ASTM E90 and ASTM E1425, and based on 1" insulating glass.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum curtain walls that meet or exceed performance requirements.

C. Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's written approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup for type of storefront elevations indicated, in locations shown on Drawings.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of aluminum-framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

1.8 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, submit a written warranty signed by aluminum storefront and entrance system manufacturer agreeing to repair or replace curtain wall components that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
   1. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
   2. Faulty operation of entrances and hardware.
   3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

B. Extended Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

**PART 2 – PRODUCTS**

2.1 GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.
   1. Certificates: Along with substitution request, submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum curtain walls for a period of not less than 10 years.

2.2 STOREFRONT SYSTEM

A. Basis-of-Design Product: Trifab VG 451T by Kawneer Company, Inc., or FG-3000 Thermal Multiplane by Oldcastle Building Envelope.
   1. Trifab VG 451T; Kawneer IsoLock™ Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections
      a. Frame Dimensions: 2" by 4-1/2".
      b. Glass to exterior.

B. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070” wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.

C. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
D. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
   1. Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.

E. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
   1. Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel
   2. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action

F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

H. Thermal Barrier: Thermal barrier consists of 1/4" separation consisting of a two-part chemically curing, high-density, polyurethane, mechanically and adhesively joined to aluminum storefront sections; designed per AAMA TIR-A8 and tested per AAMA 505.

I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 GLAZING

A. Glazing: Comply with Section 08 8100 - Glazing.
   1. Outside glazed pressure plate format with 1” double glazed insulating glass.

B. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
   1. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
      a. Color: Black
   2. Weatherseal Sealant: ASTM C920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
      a. Color: Black.

2.4 ACCESSORIES

A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 07 9210 - Joint Sealants.

B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil thickness per coat.

2.5 FABRICATION

A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fit joints; make joints flush, hairline and weatherproof.
   3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
   4. Physical and thermal isolation of glazing from framing members.
   5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   6. Provisions for field replacement of glazing.
   7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

B. Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions.

2.6 FINISHES

A. All finishes shall be factory applied as recommended by the window manufacturer.

B. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Nonspecular mechanical finish as fabricated; etched, medium matte chemical finish; Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker); AAMA 606.1 or AAMA 608.1.
   1. Color: Black.

**PART 3 – EXECUTION**

3.1 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer’s instructions. Verify openings are sized to receive window system and sill plate is level in accordance with manufacturer’s acceptable tolerances. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.2 INSTALLATION

A. General: Install framing system in accordance with manufacturer's instructions and AAMA storefront and entrance guide specifications manual.
   1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
   2. Weathertight Construction: Install sill members and other members in a bed of sealant or with joint filler or gaskets, to provide weathertight construction. Coordinate installation with wall flashings and other components of construction.
   3. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
   4. Provide alignment attachments and shims to permanently fasten system to building structure.

5. Align assembly plumb and level, free of warp and twist. Maintain assembly dimensional tolerances aligning with adjacent work.

3.3 CLEANING AND PROTECTION

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

B. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum entrances from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum entrances at no extra cost.

C. Remove and replace glass that has been broken, chipped, cracked, or damaged during construction period.

**END OF SECTION 08 4110**

# 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. Section includes:

1. Mechanical door hardware for:

a. Swinging doors.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors
6. Installation.
7. Rough hardware.
8. Folding partitions, except cylinders where detailed.
9. Sliding aluminum doors, except cylinders where detailed.
10. Access doors and panels, except cylinders where detailed.

C. Related Sections:

1. Division 01 Section “Alternates” for alternates affecting this section.
2. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.
3. Division 09 sections for touchup finishing or refinishing of existing openings modified by

### 1.3 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

C. California Code of Regulations

1. Title 24: California Building Standards Code

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.

    a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

3. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

    a. Door Index; include door number, heading number, and Architects hardware set number.
    b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
    c. Type, style, function, size, and finish of each hardware item.
    d. Name and manufacturer of each item.
    e. Fastenings and other pertinent information.
    f. Location of each hardware set cross-referenced to indications on Drawings.
    g. Explanation of all abbreviations, symbols, and codes contained in schedule.
    h. Mounting locations for hardware.
    i. Door and frame sizes and materials.
    j. Name and phone number for local manufacturer's representative for each product.

4. Key Schedule:

    a. Initiate and conduct meeting(s) with Owner representatives and hardware supplier to determine system keyway(s), keybow styles, structure, stamping, degree of physical

security and degree of geographic exclusivity. Furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner.

b. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
c. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
d. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
e. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
f. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
    1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

5. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier and Installer.
2. Product Certificates for electrified door hardware, signed by manufacturer:

    a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Certificates of Compliance:
4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:

    a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
    b. Catalog pages for each product.
    c. Name, address, and phone number of local representative for each manufacturer.
    d. Final approved hardware schedule, edited to reflect conditions as-installed.
    e. Final keying schedule
    f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
    g. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

## 1.5 QUALITY ASSURANCE

A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.

1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)

    a. Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.

2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.

B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

D. Fire-Rated Door 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 are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

F. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

G. Means of Egress Doors: Latches do not require more than 5 lbs (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.

H. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbs (22.2 N).
2. Maximum opening-force requirements:

    a. Interior, Non-Fire-Rated Hinged Doors: 5 lbs (22.2 N) applied perpendicular to door.
    b. Fire Doors: The minimum opening force allowable by the appropriate administrative authority, not to exceed 15 lbs (66.7N).

3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
4. Adjust closer so that the time required to move the door from the 90 degree position to 12 degrees from the latch is 5 seconds minimum.

I. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Review required testing, inspecting, and certifying procedures.

J. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.

a. Attendees: Door hardware supplier, door hardware installer, Contractor.
b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer’s original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.7 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Existing Openings:

1. Prior to submittal, carefully inspect existing conditions to verify finish hardware required to complete Work, including sizes, quantities, existing hardware scheduled for re-use, and sill condition material. If conflict between the specified/scheduled hardware and existing conditions, submit request for direction from Architect. Include date of jobsite visit in the submittal.
2. Submittals prepared without thorough jobsite visit by qualified hardware expert will be rejected as non-compliant.

E. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Years from date of Substantial Completion, for durations indicated.

a. Closers:
1) Mechanical: 30 years.

b. Exit Devices:
1) Mechanical: 3 years.

c. Locksets:
1) Mechanical: 3 years (L9000 series), 10 years (ND series).

d. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

A. Maintenance Tools:

1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.10 REGULATORY REQUIREMENTS**:**

A. Locate latching hardware between 34 inches to 44 inches above the finished floor, per 2022 California Building Code, Section 11B-404.2.7.

1. Panic hardware: locate between 36 inches to 44 inches above the finished floor.

B. Handles, pull, latches, locks, other operable parts**:**

1. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. 2022 California Building Code Section 11B-309.4.
2. Force required to activate the operable parts: 5.0 pounds maximum, per 2022 California Building Code Section 11B-309.4.

C. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.

1. Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.

D. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least 5 seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per 2022 California Building Code Section 11B-404.2.8.

E. Smooth surfaces at bottom 10 inches of push sides of doors, facilitating push-open with wheelchair footrests, per 2022 California Building Code Section 11B-404.2.10.

1. Applied kickplates and armor plates: bevel the left and right edges; free of sharp or abrasive edges.
2. Tempered glass doors without stiles: bottom rail may be less than 10 inches if top leading edge is tapered 60 degrees minimum.

F. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than 4 inches. 2022 California Building Code Section 11B-404.2.3.

1. Exception: In alterations, a projection of 5/8 inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.
2. Door closers and overhead stops: not less than 78 inches above the finished floor or ground, per 2022 California Building Code 11B-307.4.

G. Thresholds**:** floor or landing no more than 0.50 inches below the top of the threshold of the doorway, per 2022 California Building Code Section 11B-404.2.5. Vertical rise no more than

0.25 inches, change in level between 0.25 inches and 0.50 inches**:** beveled to slope no greater than 1**:**2 (50 percent slope). 2022 California Building Code Section 11B-303.2 & ~.3.

H. Floor stops**:** Do not locate in path of travel. Locate no more than 4 inches from walls.

I. Pairs of doors with independently-activated hardware both leafs**:** limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per 2022 California Building Code Section 11B-703.4.2.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Where “No Substitute” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturer” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

### 2.2 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.

1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
2. Use materials which match materials of adjacent modified areas.
3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

## 2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series
2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series, Stanley FBB Series

B. Requirements:

1. Provide five-knuckle ball bearing hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. 2 inches or thicker doors:

   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins

8. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
9. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.
10. 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.
11. Provide mortar guard for each electrified hinge specified.
12. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

## 2.4 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

## 2.5 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers and surface vertical rod exit device strikes. Factory-prep coordinators for vertical rod devices if required.

## 2.6 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage L9000 series
2. No substitutions.

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
2. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
3. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
4. UL Listed – 3 hour fire door
5. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

    a. Lever Design: As scheduled.

## 2.7 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage ND Series
2. Acceptable Manufacturers and Products: No substitutions.

B. Requirements:

1. Provide cylindrical locks conforming to the following standards and requirements:

    a. ANSI/BHMA A156.2 Series 4000, Grade 1.
    b. UL 10C for 4'-0" x 10'-0" 3-hour fire door.

2. Cylinders: Refer to "KEYING" article, herein.
3. 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 Test – minimum 3,100 inch-pounds without gaining access
    b. Cycle life - tested to minimum 10 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers.

4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate 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. Provide electrified options as scheduled in the hardware sets.

9. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.

    a. Lever Design: As scheduled.

## 2.8 AUXILIARY LOCKS

A. Deadlocks:

1. Manufacturers and Products:

    a. Scheduled Manufacturer and Product: Schlage L9000 series

B. Acceptable Manufacturers and Products: No substitutions.

1. Requirements:

    a. Provide mortise deadlock series conforming to ANSI/BHMA A156 and function as specified. Cylinders: Refer to “KEYING” article, herein.
    b. Provide deadlocks with standard 2-3/4 inches (70 mm) backset. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
    c. Provide manufacturer’s standard strike.

## 2.9 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 98 series.
2. Acceptable Manufacturers and Products: No substitutions.
3.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
3. Touchpad: Extend minimum of one half of door width. Match exit device finish, stainless steel for US26, US26D, US28, US32, and US32D finishes; and for all other finishes, provide compatible finish to exit device. No plastic inserts are allowed in touchpads.
4. Provide exit devices with dead-latching feature for security and for future addition of alarm kits and/or other electrified requirements.
5. Provide flush end caps for exit devices.
6. Provide exit devices with manufacturer’s approved strikes.
7. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
8. 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.
9. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will

travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.

a. Lever Style: Match lever style of locksets.

10. Accessibility: Maximum 5lbs force to retract latch bolt per CBC Chapter 11B.

a. “AX” feature: touchpad directly retracts the latchbolt with 5 lb or less of force. Provide testing lab certification confirming that the mechanical device is independent third-party tested to meet this 5 lb requirement.

11. Provide UL labeled fire exit hardware for fire rated openings.

## 2.10 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage
2. Acceptable Manufacturers: No substitutions.

B. Requirements:

1. Provide interchangeable (FSIC) cylinders/cores to match Owner’s existing key system, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.
2. Replaceable Construction Cores.

a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
1) 3 construction control keys
2) 12 construction change (day) keys.

b. Owner or Owner’s Representative will replace temporary construction cores with permanent cores.

## 2.11 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Provide cylinders/cores keyed into Owner’s existing factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

C. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.

a. Schlage Everest “E” or “T” (Verify with District lock shop).

b. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
3. Provide keys with the following features:

   a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   b. Patent Protection: Keys and blanks protected by one or more utility patent(s).

4. Identification:

   a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.
   b. Identification stamping provisions must be approved by the Architect and Owner.
   c. Stamp cylinders/cores and keys with Owner’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE” along with the “PATENTED” or patent number to enforce the patent protection.
   d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
   e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

5. Quantity: Furnish in the following quantities.

   a. Change (Day) Keys: 3 per cylinder/core.
   b. Permanent Control Keys: 3.
   c. Master Keys: 6.

## 2.12 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4010/4110 series
2. Acceptable Manufacturers and Products: Sargent 281/281P10/281TJ series factory assembled (without PRV)

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. 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. Cylinder Body: 1-1/2 inch (38 mm) diameter, with 5/8 inch (16 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.

6. Hydraulic Regulation: By tamper-proof, non-critical valves with separate adjustment for latch speed, general speed, and back-check.
7. Provide closers with a solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. 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.

## 2.13 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

## 2.14 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.

2. Sizes of plates:

    a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
    b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
    c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

## 2.15 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson
2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

## 2.16 DOOR STOPS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

## 2.17 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International
2. Acceptable Manufacturers: National Guard, Pemko

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:

    a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
    b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

## 2.18 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

## 2.19 LATCH PROTECTORS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Rockwood, Trimco

B. Provide stainless steel latch protectors of type required to function with specified lock.

## 2.20 COAT HOOKS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Rockwood, Trimco

B. Provide coat hooks as specified.

2.21 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
3. Protection Plates: BHMA 630 (US32D)
4. Overhead Stops and Holders: BHMA 630 (US32D)
5. Door Closers: Powder Coat to Match
6. Wall Stops: BHMA 630 (US32D)
7. Latch Protectors: BHMA 630 (US32D)
8. Weatherstripping: Clear Anodized Aluminum
9. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Existing frames and doors to be retrofitted with new hardware**:**

1. Field-verify conditions and dimensions prior to ordering hardware. Fill existing hardware cut outs not being reused by the new hardware. Remove existing hardware not being reused, return to Owner unless directed otherwise.
2. Cut and weld existing steel frames currently prepared with 2.25 inch height strikes. Cut an approximate 8 inch section from the strike jamb and weld in a reinforced section to accommodate specified hardware’s strike.
3. Patch and weld flush filler pieces into existing door hardware preparations in steel doors and frames, leave surfaces smooth.

3.2 PREPARATION

A. Where on-site modification of doors and frames is required:

1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
2. Field modify and prepare existing door and frame for new hardware being installed.
3. When modifications are exposed to view, use concealed fasteners, when possible.
4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:

a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

## 3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying section.

I. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

J. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

K. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

L. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

M. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

N. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

O. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

P. Field-verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware.

Q. Remove existing hardware not being reused. Tag and bag removed hardware, turn over to Owner.

R. Where existing wall conditions will not allow door to swing using the scheduled hinges, provide wide-throw hinges and if needed, extended arms on closers.

S. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.

## 3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

## 3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

## 3.6 DEMONSTRATION

A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.7 DOOR HARDWARE SCHEDULE

A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Do not order material until submittal has been reviewed, stamped, and signed by Architect's door hardware consultant.

C. Hardware Sets:

HW SET: 01

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | STOREROOM LOCK | ND80TD RHO | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 SHCUSH ST-1586 SPEC | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

EXISTING: REPLACE HARDWARE.
VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING DOOR/FRAME CONDITIONS PRIOR TO ORDERING HARDWARE.

HW SET: 02

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | PRIVACY LOCK W/INDICATOR | ND40S RHO OS-OCC | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4111 EDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | WALL STOP | WS401/402CCV | 626 | IVE |
| 1 | SET | GASKETING | 328AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |
| 1 | EA | COAT AND HAT HOOK | 582 | 626 | IVE |

EXISTING: REPLACE HARDWARE.
VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING DOOR/FRAME CONDITIONS PRIOR TO ORDERING HARDWARE.

HW SET: 03

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1HW 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | PANIC HARDWARE | CDSI-PA-AX-98-NL | 626 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX | 626 | SCH |
| 1 | EA | MORTISE CYLINDER | 20-061 ICX X XQ11-948 (DOGGING) | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4111 HEDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | FLOOR STOP | FS18S | BLK | IVE |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING FRAME CONDITIONS PRIOR TO ORDERING HARDWARE.

HW SET: 04

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | CLASSROOM LOCK | ND70TD RHO | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 SHCUSH ST-1586 SPEC | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

HW SET: 05

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | CLASSROOM SECURITY W/INSIDE INDICATOR | ND78TD RHO IS-CRS | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 HEDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | FLOOR STOP | FS18S | BLK | IVE |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING FRAME CONDITIONS PRIOR TO ORDERING HARDWARE.

HW SET: 06

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | ENTRANCE LOCK W/ INSIDE INDICATOR | ND53TD RHO IS-LOC | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 HEDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | FLOOR STOP | FS18S | BLK | IVE |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

HW SET: 07

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | ENTRANCE LOCK W/ INSIDE INDICATOR | ND53TD RHO IS-LOC | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4011 | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | SET | GASKETING | 328AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING FRAME CONDITIONS PRIOR TO ORDERING HARDWARE.

HW SET: 08

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | CLASSROOM DEAD LOCK | L9463T XB11-720 | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | PUSH PLATE | 8200 8" X 16" | 630 | IVE |
| 1 | EA | PULL PLATE | 8302 10" 4" X 16" | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 HEDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | FLOOR STOP | FS18S | BLK | IVE |
| 1 | EA | RAIN DRIP | 142AA (OMIT @ OVERHANG) | AA | ZER |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING FRAME CONDITIONS PRIOR TO ORDERING HARDWARE. INSTALL HEAD SEAL BEFORE CLOSER.

HW SET: 09

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | CLASSROOM DEAD LOCK | L9463T XB11-720 | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | PUSH PLATE | 8200 8" X 16" | 630 | IVE |
| 1 | EA | PULL PLATE | 8302 10" 4" X 16" | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 HEDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | FLOOR STOP | FS18S | BLK | IVE |
| 1 | EA | RAIN DRIP | 142AA (OMIT @ OVERHANG) | AA | ZER |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING FRAME CONDITIONS PRIOR TO ORDERING HARDWARE. INSTALL HEAD SEAL BEFORE CLOSER.

HW SET: 10

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | KEYED PRIVACY W/IND | L9485T 06A 09-544 OS-OCC | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4011 DEL | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | MOP PLATE | 8400 4" X 1" LDW B-CS | 630 | IVE |
| 1 | EA | WALL STOP | WS401/402CCV | 626 | IVE |
| 1 | EA | RAIN DRIP | 142AA (OMIT @ OVERHANG) | AA | ZER |
| 1 | SET | GASKETING | 328AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

VERIFY ALL HARDWARE IS COMPATIBLE WITH EXISTING FRAME CONDITIONS PRIOR TO ORDERING HARDWARE.

HW SET: 11

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | PRIVACY LOCK W/INDICATOR | ND40S RHO OS-OCC | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4011 DEL | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | MOP PLATE | 8400 4" X 1" LDW B-CS | 630 | IVE |
| 1 | EA | WALL STOP | WS401/402CCV | 626 | IVE |
| 1 | SET | GASKETING | 328AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |
| 1 | EA | COAT AND HAT HOOK | 582 | 626 | IVE |

HW SET: 12

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 | 652 | IVE |
| 1 | EA | CLASSROOM LOCK | ND70TD RHO | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | WALL STOP | WS401/402CCV | 626 | IVE |
| 3 | EA | SILENCER | SR64 | GRY | IVE |

HW SET: 13

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 3 | EA | HINGE | 5BB1 4.5 X 4.5 NRP | 630 | IVE |
| 1 | EA | STOREROOM LOCK | ND80TD RHO | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | SURFACE CLOSER | 4111 EDA | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 10" X 2" LDW B-CS | 630 | IVE |
| 1 | EA | FLOOR STOP | FS18S | BLK | IVE |
| 1 | SET | DOOR SEAL | 429AA-S (HEAD & JAMBS) | AA | ZER |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | PER DETAIL | A | ZER |

HW SET: G01

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| 1 | EA | PANIC HARDWARE | OUT-PA-AX-98-L-NL-06-WH | 630 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |

GATE PIVOT/CLOSER TO BE REUSED FROM PREVIOUS LOCATION.
BALANCE OF HARDWARE PROVIDED BY GATE FABRICATOR.
PROVIDE MOUNTING PLATES AS REQUIRED.

HW SET: G02

| QTY | | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|---|
| | | GATE HINGES | PROVIDED BY GATE FABRICATOR | | B/O |
| 1 | EA | LOCKABLE CANE BOLT | PROVIDED BY GATE FABRICATOR | | B/O |
| 1 | EA | STOREROOM LOCK | ND80TD RHO | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 ("E" KEYWAY) | 626 | SCH |
| 1 | EA | LOCK GUARD | LG SERIES | 630 | IVE |
| 1 | EA | MORT LOCK BOX | K-BXMOR1 | | KEE |

BALANCE OF HARDWARE PROVIDED BY GATE FABRICATOR.
PROVIDE MOUNTING PLATES AS REQUIRED.

End of Section

## SECTION 08 8100 - GLASS GLAZING

## PART 1 - GENERAL

1.1 SUMMARY

A. Provide glazing and glazing accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 07 9210: Sealants and caulking.
3. Section 08 1110: Glazing for vision panels in metal doors and frames is specified in this Section.
4. Section 08 4110: Glazing for aluminum framing is specified in this Section.
5. Section 09 9100: Field painting of metal panels.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation.
3. Samples: Submit 2 samples, 4" x 4" in size, of each type of glass and gasket proposed for use.

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
1. Manufacturer's recommended cleaning procedures for each type of glazing panel.

1.3 QUALITY ASSURANCE

A. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with pertinent recommendations contained in:
1. Flat Glass Marketing Association:
a. "Glazing Sealing Systems Manual";
b. "Glazing Manual".

B. Identification of Safety Glazing:
1. Identify each light of safety glass material installed in hazardous locations as defined in CBC 2406.3 by a label that complies with CBC 2403.1 and which will specify the labeler, whether manufacturer or installer, and state that safety glazing material has been utilized in such installations.
2. The label shall be legible and visible from the inside of the building after installation and shall be acid etched, sand blasted, ceramic fired laser etched, or embossed.

C. Provide tinted or coated glazing panels by one and the same manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. During storage and handling of glass, provide cushions at edges to prevent impact damage.

1.5 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, submit 2 original copies of glazing manufacturer's written warranty, countersigned by the glazing subcontractor and the Contractor, covering warranties listed below and including removal of the failed or deteriorated glazing, furnishing the matching replacement glazing, and properly installing the matching replacement glazing.

1. Coated Single Pane Glass: Warranty glass for **10 years** against coating deterioration.
2. Sealed Insulating Glass Units: Warranty units for **5 years** against seal failure, interpane dusting or misting.
3. Laminated Glass: Warranty glass for **5 years** against failure of lamination. Failure of lamination shall include, but shall not be limited to, evidence of delamination, loss of transparancy, change in color, change in light transmittance, deterioration of concealed glass coating or plastic sheet coating if provided, loss of acoustic rating, and other forms of deterioration due to defective materials or workmanship.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 GLASS

A. General:
1. For all glass, provide the type and thickness shown on the Drawings or specified herein.
2. Where type or thickness, or both, are not shown on the Drawings or specified herein, provide type and thickness directed by the Architect.

B. Primary Glass:
1. Provide primary glass complying with ASTM C1036.
2. Clear Float Glass: Type I, class 1 (transparent), quality q3 (glazing select).
3. Tinted Float Glass: Type I, class 2 (heat absorbing and light reducing), quality q3 (glazing select), of tint as indicated or specified.

C. Tempered Glass: Grade B (fully tempered), style I (uncoated surfaces), type I (float), class 1 (transparent), quality q3 (glazing select). All tempered glass is to be safety glass and meet human impact loads indicated below.
1. Tints: Tints as indicated or specified.
2. Sizes and Cutting:
   a. Prior to tempering, cut glass to required sizes as determined by accurate measurements of the openings to be glazed, making allowances for required edge clearances.
   b. Cut and process edges in accordance with the glass manufacturer's recommendations.
   c. Do not cut or treat edges in the field.

D. Human Impact Loads: Individual glazed areas, including glass mirrors, in hazardous locations as defined by CBC Section 2406.4 shall comply with CBC Sections 2406.1 through 2406.5.

2.3 OTHER MATERIALS

A. Provide other materials, including but not limited to shims, setting blocks, glazing tape, etc., not specifically described but required for a complete and proper installation, as recommended by the manufacturer.

2.4 EXTERIOR GLAZING ASSEMBLIES

A. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure air barrier:
   1. In conjunction with joint sealer materials described in other sections.
   2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier seal.
   3. To maintain a continuous air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.5 GLAZING PANEL TYPES

A. **Type A:** 1/4" thick, clear, fully tempered glass.

B. **Type F:** 1" thick tinted insulating glass unit; fully tempered.
   1. Outdoor Lite: 1/4" fully tempered glass with Graylite II tint with PPG Solarban 60 Low-E coating inside facing surface.
   2. Air Space: 1/2" air space filled with gas (90% Argon, 10% air).
   3. Indoor Lite: 1/4" clear fully tempered glass.
   4. NFRC U-Value: 0.24 BTU/hr $ft^2$ $^oF$ (winter nighttime).
   5. Solar Heat Gain Coefficient: 0.13.
   6. Light to Solar Gain: 0.46.
   7. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   8. Edge Spacers: Aluminum, bent and soldered corners; color as selected by Architect.
   9. Edge Seal: Glass to elastomer with supplementary silicone sealant.
   10. Purge interpane space with dry hermetic air.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Clean glazing channels, stops, and rabbets to receive the glazing materials, making free from obstructions and deleterious substances which might impair the work.
   1. Remove protective coatings which might fail in adhesion or interfere with bond of sealants.
   2. Comply with manufacturers' instructions for final wiping of surfaces immediately prior to application of primer and glazing compounds or tapes.
   3. Prime surfaces to receive glazing compounds in accordance with manufacturers' recommendations.

3.2 INSTALLATION

A. Inspect each piece of glass immediately prior to start of installation.
   1. Do not install items which are improperly sized, have damaged edges, or are scratched, abraded, or damaged in any other manner.
   2. Do not remove labels from glass until so directed by the Architect.
   3. Install glass so distortion waves, if present, run in the horizontal direction.

B. Locate setting blocks at sills one quarter of the width of the glass in from each end of the glass, unless otherwise recommended by the glass manufacturer.
   1. Use blocks of proper size to support the glass in accordance with the manufacturer's recommendations.
   2. Provide spacers for all glass sizes larger than 50 united inches, to separate glass from stops; except where continuous glazing gaskets or felts are provided.
      a. Locate spacers no more than 24" apart, and no closer than 12" to a corner.
      b. Place spacers opposite one another.
      c. Make bite of spacer on glass 1/4" or more.

C. Set glass in a manner which produces the greatest possible degree of uniformity in appearance.

D. Do not use two different glazing materials in the same joint system unless the joint use is approved by the Architect.

E. Mask, or otherwise protect, surfaces adjacent to installation of sealants. Provide black continuous caulking sealant bead at all glass to metal frame joints, over exposed edge of tape, interior and exterior.

F. Miter-cut and seal the joints of glazing gaskets in accordance with the manufacturer's recommendations, to provide watertight and airtight seal at corners and other locations where joints are required.

3.3 PROTECTION

A. Protect glass from breakage after installation by promptly installing streamers or ribbons, suitably attached to the framing and held free from glass. Do not apply warning markings, streamers, ribbons, or other items directly to the glass except as specifically directed by the Architect.

3.4 CLEAN-UP

A. Clean glass thoroughly prior to final acceptance. Take special care not to remove materials which may scratch glass. **Scratched glass will be rejected and replaced prior to acceptance.**

**END OF SECTION 08 8100**

## SECTION 09 0175 - PREPARATION OF EXISTING SURFACES FOR PAINTING AND WALLCOVERING

### PART 1 - GENERAL

1.1 SUMMARY

A. Clean, repair, and prepare existing surfaces scheduled for painting or wallcovering as specified below, as indicated on the Drawings, and as required by the finish material manufacturer.

B. Related Sections
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2 Section 09 7200: Wall covering.
3 Section 09 9100: Painting.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

### PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

### PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 GENERAL REQUIREMENTS

A. Perform cleaning, repair, and preparation procedures in strict accordance with the finish material manufacturers' recommendations.

B. Remove removable items which are in place and are not scheduled to receive paint or which must be removed to be painted. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.

3.3 CLEANING

A. General Cleaning:
1. Clean each surface to be painted prior to applying paint or surface treatment.
2. Remove dirt and other foreign substances. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F, prior to start of mechanical cleaning.
3. Schedule the cleaning so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.

B. Exterior Cleaning and Pretreatment:
1. Clean all exterior surfaces thoroughly with an approved cleaner and water blasting equipment.
2. After water blasting, completely kill and remove mildew accumulation with a mildew stain remover such as X-14 by White Laboratories, or approved equal.

3.4 PREPARATION OF EXISTING SURFACES

A. Previously Painted Surfaces:
1. Prepare all existing surfaces for proper bond between new paint and existing surface, as recommended by the paint manufacturer.
2. Remove all blistered, peeling and scaling paint to a sound substrate and sand to produce a smooth transition from substrate to existing paint.
3. **Feather edge sand where existing finishes have been removed and the immediate adjacent area has sharp or raised edges.** Sand smooth all chips or runs (highs and lows) so that surface transitions are not visible from a distance of 5'-0".
4. Remove heavy chalk.
5. Sand all glossy areas and dust clean.
6. Clean and spot prime bare and repaired areas. Spot prime with manufacturer's recommended "stain killer" all marks which may bleed through surface finishes.
7. Remove invisible residue on protected areas such as eaves and ceilings using soap and water.
8. Seal all joints.

B. Gypsum Board:
1. Sand all joint compound surfaces smooth and flush with surface with fine grit sand paper.
2. Fill nicks, scratches, holes, and uneven spots with spackling compound and after dry, sand flush with surface.
3. Remove all sanding dust.
4. Where removal of existing wall coverings or other finishes damages the gypsum board substrate, repair damage by filling or floating surfaces to provide acceptable surface for new finishes.

C. Masonry and Cement Plaster:
1. Allow patched areas to dry at least 30 days prior to cleaning in preparation for painting.
2. Patch holes and cracks flush with surface.
3. Remove all loose plaster down to a solid surface. Coat all broken, cracked, damaged or areas where plaster has been removed with Weld-Crete by LARSEN PRODUCTS CORP. or approved equal, apply a cement plaster finish coat consisting of 1 part plastic cement to 3 parts sand to match the existing finish. "V" out, fill, and finish flush all cracks and texture to match adjoining surface.
4. Remove glaze, efflorescence, laitance, surface deposits, and other foreign matter.

D. Wood, Painted Finish:
1. Set all finish nails. Patch and fill all holes and surface imperfections.
2. Remove surface deposits of sap and pitch by scraping and cleaning with mineral spirits.
5. Fill cracks, holes, and scratches with suitable wood filler or spackling compound. When dry, sand flush with surface.

E. Wood, Stained Finish:
   1. Remove existing hardware, catalog, and store for reuse.
   2. Sand existing surfaces to remove existing finishes and prepare for new finishes.
   3. Sand smooth all wood surfaces exposed to view, using the proper sandpaper and remove dust. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface.

F. Metal:
   1. Thoroughly clean surfaces until free from dirt, oil, and grease. Remove all mill scale, rust formation, etc.
   2. On galvanized surfaces, use solvent for the initial cleaning, and then treat the surface thoroughly with phosphoric acid etch. Remove etching solution completely before proceeding.
   3. Allow to dry thoroughly before application of paint.

G. Concrete:
   1. Thoroughly clean surfaces.
   2. Fill cracks and void using approved methods.
   3. Fill all holes and cracks with an approved patching compound for the size of patch required. Provide Star Stucco patching compound or approved equal.
   4. Allow patched areas to dry at least 30 days prior to cleaning in preparation for painting.
   5. Prior to painting, the material shall be dry to the extent that a proper, long lasting, and non-blistering bond will be assured. Should the dryness of the substrate be in question, test the substrate in the presence of the paint manufacturer's representative. Do not paint substrate in question until dryness condition improves to meet the paint manufacturer's requirements.

H. Glazing Compounds: Remove all loose and deteriorated glazing compounds and repair with an approved glazing compound prior to painting.

**END OF SECTION 09 0175**

## SECTION 09 0560 - COMMON WORK RESULTS FOR FLOORING PREPARATION

### PART 1 - GENERAL

1.1 SUMMARY

A. Provide floor preparation and moisture testing as specified herein and as needed for a complete and proper flooring installation. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:

1. Resilient tile and sheet.
2. Broadloom carpet.
3. Carpet tile.
4. Thin-set ceramic tile and stone tile.

B. This Section includes:
1. Preparation of new and existing concrete floor slabs for installation of floor coverings.
2. Testing of concrete floor slabs for moisture and pH.
3. Remediation of concrete floor slabs due to unsatisfactory moisture or pH conditions.
    a. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
4. Removal of existing floor coverings where indicated on the Drawings.

C. The Owner’s independent testing shall conduct the following tests:
1. Vapor Emissions Testing.
2. Relative Humidity Testing.
3. Ph (Alkalinity) Testing.

D. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 03 3300: Cast-in-place concrete floor slabs.
3. Section 09 6110: Moisture control treatment for flooring.
4. Section 09 6500: Resilient flooring.
5. Section 09 6800: Carpeting.

1.2 CASH ALLOWANCE

A. Not Applicable.

1.3 REFERENCES

A. All work shall be performed in accordance with the Drawings and Specifications, and with the following standards:
1. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens); 2008.
2. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2008.
3. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2010.

4. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2009.
5. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; May 2011.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.5 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
1. Moisture and pH limits and test methods.
2. Manufacturer's required bond/compatibility test procedure.

C. Testing Agency's Report: Include:
1. Description of areas tested; include floor plans and photographs if helpful.
2. Summary of conditions encountered.
3. Moisture and pH test reports.
4. Copies of specified test methods.
5. Recommendations for remediation of unsatisfactory surfaces.
6. Submit report to Architect.
7. Submit report not more than two business days after conclusion of testing.

D. Adhesive Bond and Compatibility Test Report.

E. Copy of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.

1.6 QUALITY ASSURANCE

A. Moisture and pH testing will be performed by an independent testing agency employed and paid by Owner.

B. Contractor may perform adhesive and bond test with his own personnel or hire a testing agency.

C. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

1.7 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

## PART 2 - PRODUCTS

2.1 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Remedial Floor Coating: Coating intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of pH found, and suitable for adhesion of flooring without further treatment or with only the addition of a skim coat of patching compound or adhesive, as specified in Section 09 6110.

## PART 3 - EXECUTION

3.1 ORDER OF OPERATIONS

A. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
      a. Do not attempt to remove coating or penetrating material.
      b. Do not abrade surface.
   3. Preliminary cleaning.
   4. Moisture vapor emission tests.
   5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   6. pH tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   7. Specified remediation, if required.
   8. Patching, smoothing, and leveling, as required.
   9. Other preparation specified.
   10. Adhesive bond and compatibility test.
   11. Protection.

B. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
   2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating over entire suspect floor area.
   3. Excessive pH: If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.2 REMOVAL OF EXISTING FLOOR COVERINGS

A. Where removal of existing floor coverings in indicated, comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.3 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.4 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows:
   1. Place 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.5 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.6 pH TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements. This procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
   1. Use a wide range pH paper, its associated chart, and distilled or deionized water.
   2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the pH paper into the water, remove it, and compare immediately to chart to determine pH reading.
   3. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value is over 10.

3.7 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Concrete Subfloors:
   1. Verify that substrate is smooth, level, at required finish elevation, and without more than 1/8" in 10'-0" variation from level or slopes shown on the Drawings.
   2. Clean cracks, control joints, and other non-moving joints.
   3. Broom clean or vacuum the surfaces to be covered, and inspect the subfloors.
   3. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
   4. Seal patching compound with sealer recommended by the manufacturer and compatible with the flooring products specified.
   5. Do not fill expansion joints, isolation joints, or other moving joints.
   6. Prohibit traffic until patching compound is cured and sealed.

3.8 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.9 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

**END OF SECTION 09 0560**

**SECTION 09 2400 - CEMENT PLASTER**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide lath and plaster where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 06 1000: Plywood sheathing.
3. Section 07 6200: Flashing and sheet metal.
4. Section 07 9210: Elastomeric joint sealants.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
3. Samples:
a. Submit samples of the proposed accessories.
b. Provide 24" x 24" finish coat samples (on 1" foam board) of each plaster texture for approval by Architect 14 days prior to commencing work.

1.3 QUALITY ASSURANCE

A. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with materials handling and workmanship provisions of the "Reference Specifications" of the California Lathing and Plastering Contractors Association. Interior and exterior lath and plaster shall comply with CBC Chapter 25.

B. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer’s Standard Colors and Finishes: Where Finish Schedule specifies a manufacturer’s standard color or finish, Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. Contractor shall be responsible for providing colors matching those indicated on the Drawings.
3. Custom Colors: Where Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.4 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, submit 2 original copies of a warranty from the acrylic finish coat manufacturer for fading, delamination, and defective materials with an extended correction period of **3-years.**

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 LATH

A. Provide corrosion resistant lath and lath accessories.

B. Welded Wire Metal Lath: ASTM C933; galvanized, self-furring.
1. Wood and Metal Vertical Supports:
a. 16" On-center: 1.00 lb/sq yd, 1-1/2" square openings; Structalath III by Structa Wire Corp., IAPMO ER 2017.
b. 24" On-center: 2.2 lb/sq yd, 2" square openings; V-Truss Wall & Ceilings by Structa Wire Corp., IAPMO ER 2017.
2. Wood and Metal Horizontal Supports:
a. Maximum 24" On-center: 2.2 lb/sq yd, 2" square openings; V-Truss Wall & Ceilings by Structa Wire Corp., IAPMO ER 2017.

C. Paper Backing (Water Resistive Barrier): Asphalt-impregnated Type "D" paper; CBC Section 2510.6.

D. Self-Furring Lath:
1. Use of self-furring lath is permitted subject to satisfactory job-site demonstration of installation.
2. Lath shall be furred out 1/4" when installed over solid surfaces such as plywood; DSA IR 25-4.

E. Lath Fasteners:
1. Staples:
a. At vertical wood supports: Minimum 16 gauge, minimum 3/4" crown, of sufficient length to penetrate sheathing and framing members minimum of 1" into wood structural members.
b. At horizontal wood supports: Minimum 9 gauge, barbed, minimum 3/4" crown, of sufficient length to penetrate sheathing and framing members minimum of 1-1/2" into wood structural members.
2. Nails: 6d common or roofing nail with 7/16" head, 3/4" minimum embedment into stud exclusive of sheathing; ASTM C1063.
3. Screws: 7/16" pan wafer head, Type S, 0.120" shank; ASTM C1002 and/or C 954.
a. Into Wood: #12 zinc pan head; 5/8" minimum penetration into wood.
1) 1-1/4" minimum penetration into stud where applying lath over insulation board.
b. Into Metal: Self-drilling and tapping; penetrate steel thickness plus 3 threads.
4. Powder Actuated Fasteners: Use fastener recommended for the specific use intended.
a. For concrete and masonry substrates only.
b. Factory washer (disc).
c. Demonstrate a minimum 50 pound pull out value.
d. 1-1/4" minimum embedment.

2.3 METAL ACCESSORIES

A. Metal Corner Beads: Prefabricated, No. 1A expanded metal corner bead, small nose corner beads fabricated from zinc alloy, with expanded flanges of large mesh diamond lath to allow full encasement by plaster.
B. Casing Beads: Prefabricated, No. 66 short flange casing bead, square-edged style, with short flange, zinc-

coated galvanized steel.

C. Control Joints - One Piece Type: Prefabricated, No. 15 expansion joint; Folded pair of non-perforated screeds in M-shaped configuration, with expanded flanges, zinc-coated galvanized steel.

D. Weep Screed: Prefabricated, No. 7 foundation sill screed o J-weep; zinc-coated galvanized steel with nailing flange.

E. Inside Corner Control Joint: Prefabricated No. 30, folded pair of non-perforated screeds in W-shaped configuration, with expanded flanges.

2.4 PLASTER

A. Comply with ASTM C926 for Portland cement plaster base and finish coat mixes as applicable bases, materials and other requirements indicated.
   1. Portland Cement, ASTM C150, Type II or IV.
   2. Plastic Cement: ASTM C1328; no additional lime or plasticizer shall be added.
   3. Sand Aggregate for Base Coat: ASTM C897.

B. Portland Cement Plaster Base Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume for cementitious material and in parts by volume per sum of cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.
   1. Three coat work over metal lath.
   2. Scratch Coat: 1 part Portland cement plaster, 2-1/2 to 4 parts sand.
   3. Brown Coat: 1 part Portland cement plaster, 3 to 5 parts sand.

C. Polymer-Based Exterior Finish Coat: 100% acrylic polymer finish coat with integral color as indicated on the Finish Schedule, applied over stucco brown coat; Standard Finish by Dryvit Systems, Inc., Senerflex Finish by Senergy, or Sto Powerwall Finish by Sto Corp.

D. Interior Finish Coat: 2:1 silica sand / cement mixture; sand smooth for paint finish.

2.5 OTHER MATERIALS

A. Water for Mixing and Finishing Plaster: Drinkable, free of substances capable of affecting plaster set or of damaging plaster, lath or accessories.

B. Bonding Agent for Portland Cement Plaster: ASTM C932.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 WATER-RESISTIVE BARRIER INSTALLATION

A. General: Install 2 layers water resistive barrier over all sheathing, or continuous insulation where occurs.
   1. Install layers independently of each other such that each layer provides a separate continuous plane and any flashing is directed between the layers.
   2. Install with minimum 2" horizontal laps and 6" vertical laps.
   3. Water resistive barrier is not required on ceilings or soffits.

B. Integrate water resistive barrier with flashings such that water resistive barrier always laps over flashing.

C. Install water resistive barrier taut with a minimum of wrinkles and with care to eliminate punctures, tears or rips during application and the application of metal lath.

D. Repair holes, tears or rips.

3.3 LATH INSTALLATION

A. Lath: CBC Section 2507.3 and 2510.
   1. Welded Wire Lath: Fasteners shall engage vertical cross wires at the furring crimps, at the intersection of longitudinal wire and cross wire, or at any point along the longitudinal wire.

B. Fastener Spacing:
   1. Space fasteners at 6" on center along supports.
   2. Bend common nails over to engage not less than 3 strands of lath.

C. Soffit Earthquake Nailing: At horizontal soffits, provide additional fasteners along each support and within 3" of the edge of each sheet; 9 gage ring-shank hook staple, 3/4" wide hook, 1-1/2" long.

3.4 INSTALLATION OF PLASTERING ACCESSORIES

A. Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated.
   1. Miter or cope accessories at corners; install with tight joints and in alignment.
   2. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.

B. Corner Bead: Install at external corners.

C. Casing Beads: Install at termination of plaster work unless otherwise indicated.

D. Control Joints: Install control joints at locations indicated, or if not indicated, at locations complying with the following criteria and approved by the Architect.
   1. Where expansion or control joint occurs in construction directly behind plaster membrane.
   2. Where distance between control joints in plastered surface exceeds 144" in either direction.
   3. Where area within Portland Cement panels exceed 100 sq. ft.
   4. Where Portland Cement plaster panel sizes or dimensions change. Extend joints full width or height of plaster membrane.
   5. At corners of door and window frames.
   6. Directly over changes in substrate materials.

E. Install accessories flush with metal frames and other built-in items unless otherwise indicated.

3.5 PLASTER APPLICATION

A. Comply with all provisions of CBC Section 2512.

B. Portland Cement Plaster Application Standard: Apply Portland Cement plaster materials, compositions, and mixes to comply with ASTM C926. In addition to specified standards, apply plaster as follows:
   1. Scratch coat: Score scratch coat horizontally only to achieve a mechanical bond with the brown coat.
   2. Cold Joints: Cold joints in plaster will not be permitted within a panel, or between screeds, joints, or reveals.

C. Tolerances: Do not deviate more than 1/8" in 10'-0" from a true plane in finished plaster surfaces, as measured by a 10'-0" straightedge placed at any location on surface.

D. Plaster flush with metal frames and other built-in metal items or accessories which act as a plaster ground, unless otherwise indicated. Where plaster is not terminated at metal by casing beads, cut base coat free from metal before plaster sets and groove finish coat at the junctures with metal.

E. Walls: Provide 7/8" thick three 3-coat plastering method on walls (3/4" base + 1/8" finish).

F. Ceilings and Soffits: Provide 3/4" thick three 3-coat plastering method on ceilings and soffits.

G. Concealed Plaster: Where plaster application will be concealed by wood paneling, above suspended ceilings and similar locations, finish-coat may be omitted; where concealed behind cabinets and similar furnishings and equipment, apply finish-coat; where used as a base for adhesive application of tile and similar finishes, omit finish-coat and coordinate thickness with overall dimension as shown, and comply with tolerance specified.

H. Number of Coats: Apply Portland Cement plaster, of composition indicated, using 3-coat work over the following plaster bases: Metal lath, scratch coat, brown coat, finish coat.

## 3.6 CURING

A. Moist cure Portland Cement plaster base and finish coats to comply with ASTM C926, including recommendations for time between coats and during in "Annex A2 Design Considerations".

B. Keep cement basecoat hydrated and allow the cement to chemically cure and harden. Moist cure as needed, morning and evening as required to produce a hard basecoat.

C. Basecoat shall be allowed to cure a minimum of 7 days before applying a finish coat. If feasible allow the basecoat to cure 14 days prior to applying the finish coat.

D. Plastered walls with excessive shrinkage cracks in the basecoat due to a failure to water cure shall be skim coated with a polymer-based cement coat prior to applying a finish coat.

## 3.7 FINISH COAT

A. Finish Coat Application:
   1. Apply finish coat to match mock-ups in color and texture.
   2. Acrylic Finish Coat: Apply a primer coat for light colored finishes or provide full prime coverage for all "putz" or "swirl" textures.
   3. Provide sufficient crew size to maintain a wet edge; scaffold lines shall be kept to a minimum.
   4. Maintain consistency and uniformity in application procedures and techniques.
   5. Leave adjacent surfaces clean and free of plaster materials.
   6. Leave protection of the plaster in place until finish coat is set.
   7. Repair scaffold tie-is to maintain water-resistance of plaster assembly and blend with finish coat.

B. Texture:
   1. Acrylic Finish Coat and Texture: "Sandblast" as illustrated by Dryvit Systems, Inc.
   2. Existing Construction: Finish texture to match existing cement plaster surface.
   3. Interior Wall and Ceiling: Hard smooth steel trowel finish. Trowel flush and level between control joints as shown on plans. Sand smooth for finish painting.

C. Protect finish coat in compliance with manufacturer's recommendations.

3.8 CLEANING UP

A. Promptly wipe metal accessories, and other surfaces which are not to be plastered, clean after application of each coat.

B. In addition to other protection, protect and clean adjacent surfaces from the accidental application of plaster.
C. In addition to other requirements for cleaning, immediately upon completion of this portion of the Work visually inspect adjacent surfaces and remove all traces of spilled and splashed plaster.

3.9 FIELD QUALITY CONTROL

A. Lath Inspection: No lath or lath attachments shall be covered or finished until it has been inspected and approved by the Project Inspector or special inspector.

**END OF SECTION 09 2400**

# SECTION 09 2900 - GYPSUM BOARD

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Provide gypsum drywall and accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Section includes:
1. Gypsum wallboard and accessories.
2. Joint treatment and accessories.
3. Tackboard.
4. Acoustic (sound dampening) wallboard.
5. Metal furring channels.

C. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 06 1100: Rough carpentry.
3. Section 09 0175: Preparation of existing surfaces for painting and wall covering.

### 1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Shop drawing indicating proposed control joint layout.

### 1.3 REFERENCES

A. All work shall be performed in accordance with the Drawings and Specifications, and with the following standards:
1. GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association; 2007.
2. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2007.
3. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association.
4. GA-600 - Fire Resistance Design Manual; Gypsum Association.

### 1.4 QUALITY ASSURANCE

A. Drywall installer shall coordinate with General Contractor to ensure that substrates at the ceiling line, base, and door/window frames are within a tolerance of straight, not-to-exceed 1/8" in 10', as indicated by a 10' straight edge. General Contractor shall shim as required prior to drywall installer accepting substrates. Failure to maintain the tolerances will require removal and reinstallation at no additional cost to the Owner.

B. Mock-Ups:
1. At a location on the site where approved by the Architect, provide a mock-up gypsum wallboard panel.
a. Make the panel approximately 2'-0" square.
b. Provide one mock-up panel for each gypsum wallboard finish used on the Work.
c. Revise as necessary to secure the Architect's approval.

2. The mock-up panels, when approved by the Architect, will be used as datum points for comparison with the remainder of the work of this Section for the purpose of acceptance or rejection.

C. Rated Construction: Comply with the requirements of the indicated system design number and/or test number to furnish the required rating for:
1. Sound-rated construction.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 GYPSUM WALLBOARD

A. Fire-Resistant Gypsum Wallboard: Paper-faced gypsum panels, ASTM C1396; sizes to minimize joints in place; edges tapered, ends square cut; Type X, 5/8" thick in all locations unless otherwise noted.

B. Water-Resistant, Fire-Resistant, Gypsum Wallboard: Water-resistant gypsum backing board, ASTM C1396; sizes to minimum joints in place; edges tapered, ends square cut; Type X, 5/8" thick, in widths and lengths as will result in a minimum of joints. Use at walls and ceilings of all restrooms, locker rooms, kitchens (and related food preparation and clean up rooms), unless otherwise note.

2.3 METAL ACCESSORIES

A. Finishing Accessories: ASTM C1047; galvanized steel or rolled zinc, unless otherwise indicated.

B. Casing Beads:
1. Provide channel shapes with an exposed wing, and with a concealed wing not less than 7/8" wide.
2. Provide bullnose shapes where shown on Drawings, as manufactured by Flannery, Inc., Clinch-On Corner Bead Co.

C. Corner Beads:
1. Provide angle shapes with wings not less than 7/8" wide and perforated for nailing and joint treatment at horizontal edges.
2. Provide bullnose shapes at vertical edges and where indicated on the Drawings.

D. Control Joints:
1. Provide with 1/4" wide center channel with removable tape strip and wings perforated for nailing and joint treatment at horizontal edges as manufactured by Clark Dietrich, 093 Vinc Control Joint (ZNCJ).

E. Edge Beads at Ceiling Perimeter:
1. Provide angle shapes with wings not less than 3/4" wide.
2. Provide concealed wing perforated for nailing, and exposed wing edge folded flat.
3. Exposed wing may be factory finished in white color.

F. Reveals: Extruded aluminum, alloy 6063-T5, with prepunched mounting flanges tapered to receive joint bedding, tape and top coat. Factory chromate conversion coating. As manufactured by Fry Reglet Corp., Gordon Inc., MM Systems Inc.

2.4 FASTENING DEVICES

A. Wood Framing: No. 6 Type W, bugle-head screws, length as required for single or multi-layer application; ASTM C1002.

B. Metal Framing: No. 6 Type S, bugle-head screws, length as required for single or multi-layer application; ASTM C1002.

2.5 JOINTING SYSTEM

A. Provide a jointing system, including reinforcing tape and compound, designed as a system to be used together and as recommended for this use by the manufacturer of the gypsum wallboard approved for use on the Work. ASTM C 475.

B. Jointing compound may be used for finishing if so recommended by its manufacturer.

C. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

2.6 TEXTURE

A. Primer: Manufacturer's recommended acrylic latex coating. Tuff Hide by USG.

B. Texture Material: Manufacturer's recommended product for the finish texture specified.

2.7 TACKBOARD AND SOUNDBOARD

A. 1/2" thick, with factory-primed face, specifically formulated as a backing for vinyl wallcovering.
   1. Side to which the vinyl wallcovering will be bonded shall be smooth, laminating quality.
   2. Class II (Flame Spread 26-75).

B. Acceptable Products:
   1. Industrial Insulation Board by Wood Fiber Industries.
   2. Micore 300 Board by USG Interiors, Inc.

2.8 ACOUSTICAL SEALANT

A. Acoustical Sealant: Nonbleeding and staining elastic sealant, flame spread 0, smoke developed 0; ASTM C919 and C834.

B. Acceptable Products: Sheetrock Acoustical Sealant, by USG Interiors, Inc.

2.9 SHEET METAL FURRING CHANNELS

A. Furring Channels:
   1. Hat-shaped with 2 equal legs and flanges, size as indicated on the drawings, 24 gage (0.0179 in.) minimum steel thickness.
   2. Z-shaped, slotted or unslotted web, face flange of 1-1/4", wall attachment flange of 7/8", 24 gage (0.0179 in.) minimum steel thickness, depth required to fit insulation thickness indicated.

B. Resilient Channels: Single-leg type with screw flange, punched leg, and top flange, 1/2" high, 24 gage (0.0179 in.) minimum steel thickness.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:
1. Install gypsum wallboard in accordance with the Drawings and with separate boards in moderate contact but not forced in place.
2. At internal and external corners, conceal cut edges of the boards by overlapping covered edges of abutting boards.
3. Stagger boards so that corners of any four boards will not meet at a common point except in vertical corners.

B. Ceilings:
1. Install gypsum wallboard to ceilings with the long dimension of the wallboard at right angles to the supporting members.
2. Maximum Fastener Spacing: 12" on center for screw fastening.

C. Walls:
1. Install gypsum wallboard in vertical direction, plumb and square and in full height single piece sheets wherever possible.
   a. Gypsum wallboard may be installed in horizontal direction behind vinyl covered tackboard panels.
2. Make end joints, where required, over framing, furring members, or solid backing.
3. Butt factory edges together. Do not butt a factory edge with a cut edge.
4. Maximum Fastener Spacing: 16" on center for screw fastening.

D. Tackboard:
1. Install tackboard over gypsum board or plywood in vertical direction, plumb and square and in full height single piece sheets wherever possible.
2. Use maximum size sheets to minimize joints. Cut sheets only as required.
3. Open all fiberboard packages and place fiberboard pieces singly around the room at least 24 hours before application.
4. Apply tackboard allowing 1/8" gap between boards and fasten to studs as noted in 3.2.C.
5. Provide fiberglass or polyester tape at joints.

E. Acoustical Sealant: Provide bead of acoustical sealant where indicated and in all sound wall construction as follows:
1. Intersections of walls and columns;
2. Gaps around face panels at floor;
3. Ceiling and vertical intersections;
4. In door frames; and,
5. Cutouts for electrical boxes, pipes and plumbing, and other partition penetrations.

3.3. SHEET METAL FURRING

A. Hat Channels (Resilient Channels similar):
1. Attach sheet metal furring channels by screws, nails, or bolts as best suited for the type of stud.

2. Install channels horizontally starting 2" above the finished floor and vertically spaced as recommended by the manufacturer for the total thickness of the surfacing, but not exceeding 16" on center. Splice by nesting channels not less than 8" and securely wire tie.
3. Install resilient channels "free" edge up.

B. Z-Furring:
1. Erect insulation vertically and hold in place with Z-furring members spaced at 24" on center.
2. Except at exterior corners, attached narrow flange of furring members to wall with fasteners spaced at 24" on center.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel.
4. At interior corners, space second member no more than 12" from corner and cut insulation to fit.

3.4 JOINT TREATMENT

A. General:
1. Inspect areas to be joint treated, verifying that the gypsum wallboard fits snugly against supporting framework.
2. Unless specified otherwise, treat all joints on gypsum face panels. Refer to level of finish required below.
3. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55 degrees for 24 hours prior to commencing the treatment, and until joint and finishing compounds have dried.
4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.

B. Embedding Compounds:
1. Apply to gypsum wallboard joints and fastener heads in a thin uniform layer.
2. Spread the compound not less than 3" wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Then spread a thin layer of compound over the tape.
3. After this treatment has dried, apply the number of coats of embedding compound to joints and fastener heads for the level of finish specified for the surface, spreading in a thin uniform coat to not less than 6" wide at joints, and feather edged.
4. Sand between coats as required.
5. When thoroughly dry, sandpaper to eliminate ridges and high points.

C. Finishing Compounds:
1. After embedding compound is thoroughly dry and has been completely sanded, apply a coat of finishing compound to joints and fastener heads.
2. Feather the finishing compound to not less than 12" wide.
3. When thoroughly dry, sandpaper to obtain a uniformly smooth surface, taking care to not scuff the paper surface of the wallboard or raise the nap of the gypsum board paper facing.

D. Tackboard:
1. Hand tape joints in tackboard with a hardening-type joint compound having a maximum hardening time of approximately 1-1/2 hours.
2. Apply compound so as to force material into the 1/8" gap between boards.
3. Allow tape embedding application to thoroughly dry prior to the finish application. The finish application shall be Kaiser Dual-Purpose Pre-Mix Joint Compound.

E. Backing Board: 5/8" Type “X” gypsum board, unless otherwise noted.
1. Treat all joints behind fiberglass reinforced panels.
2. Joints behind vinyl covered tackable panels are not required to be treated.

F. Gypsum Board at Fire Rated Construction: Comply with UL fire listed assemblies, or other fire rated assemblies.

3.5 LEVELS OF FINISH

A. The following descriptions of levels of finish are in accordance with GA-214. Finish gypsum board and tackboard in accordance with the Gypsum Construction Handbook as published for the construction industry by United States Gypsum Company.

B. **Level 1:** Embed tape in joint compound at all joints and interior angles. Surface free of excess joint compound. Tool marks and ridges are acceptable.
1. Provide Level 1 finish on surfaces hidden above a ceiling or soffit at sound walls, fire-rated walls, and exterior walls.
2. Provide Level 1 finish on surfaces hidden behind tack board.

C. **Level 3:** Embed tape in joint compound, and provide one additional coat of compound, over all joints and interior angles. Provide two separate coats of compound over accessories and fasteners. All joint compound shall be smooth and free of tool marks and ridges.
1. Provide Level 3 finish on all exposed finished or unfinished gypsum board surfaces not specified to receive Level 4 or 5 finish.
2. Provide Level 3 finish behind fiberglass reinforced panels installed over gypsum backing board.

D. **Level 4:** Embed tape in joint compound, and provide two additional coats of compound, over all joints and interior angles. Provide three separate coats of compound over accessories and fasteners. All joint compound shall be smooth and free of tool marks and ridges. All joint compound shall be smooth and free of tool marks and ridges.
1. Provide Level 4 finish where vinyl wall covering or dry-erase wall covering is installed on gypsum board surfaces.

E. **Level 5:** Embed tape in joint compound, and provide two additional coats of compound, over all joints and interior angles. Provide three separate coats of compound over accessories and fasteners. All joint compound shall be smooth and free of tool marks and ridges. A thin skim coat of joint compound, or a material manufactured especially for this purpose, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.
1. Provide Level 5 finish on all tackboard surfaces to receive field-applied vinyl wallcovering.

3.6 CORNER TREATMENT AND METAL ACCESSORIES

A. Internal Corners: Treat as specified for joints, except fold the reinforcing tape lengthwise through the middle and fit neatly into the corner.

B. External Corners:
1. Install the specified corner bead, fitting neatly over the corner and securing with the same type fasteners used for installing the wallboard.
2. Space the fasteners approximately 6" on centers, and drive through the wallboard into the framing or furring member.
3. After the corner bead has been secured into position, treat the corner with joint compound and reinforcing tape as specified for level of finish specified for the surface, feathering the joint compound out from 8" to 10" on each side of the corner.

C. Control Joints:
1. Walls and ceilings: Install at 30’-0” o.c. maximum spacing in either direction when planes exceed 30’-0” in length.

2. Unless locations are specifically indicated on the Drawings, Contractor shall submit a control joint plan for the architect's review.

3.7 OTHER METAL TRIM

A. General: The Drawings do not purport to show all locations and requirements for metal trim. Carefully study the Drawings and the installation, and provide all metal trim normally recommended by the manufacturer of the gypsum wallboard approved for use in this Work.

3.8 TEXTURE

A. Exposed Wall Surfaces for Paint: Provide fine orange peel finish approved by Architect on exposed gypsum board surfaces.

B. Exposed Ceiling and Soffit Surfaces for Paint: Provide fine orange peel finish approved by Architect on exposed gypsum board surfaces.

C. Provide the manufacturer's recommended primer/sealer to surfaces to receive texture prior to texturing.

3.9 MARKING AND IDENTIFICATION (CBC 703.7)

A. At all accessible concealed floors, floor-ceilings and/or attic spaces with fire walls, fire barriers, fire partitions, smoke barriers and/or smoke partitions or any other wall required to have protected openings or penetrations provide signs or stencil as follows:
   1. Located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall or partition.
   2. Letting shall be not less than 3 inches in height with a minimum 3/8 inch stroke in contrasting color stating, "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS".

3.10 CLEANING UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust, and to prevent tracking gypsum and joint finishing compound onto floor surfaces.

B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris, and surplus material of this Section.

**END OF SECTION 09 2900**

**SECTION 09 3000 - TILING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide tile where called for on the Drawings, as specified herein, and as needed for a complete and proper installation. Section includes:
   1. Tile for floor applications
   2. Tile for wall applications
   3. Tile wall base
   4. Backer board as tile substrate
   5. Trim, accessories and setting materials

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   2. Section 07 9210: Sealing and caulking of expansion joints and other joints.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturers recommended installation procedures.
   3. Samples:
      a. Tile: Submit sufficient samples of each size, color, and texture to demonstrate the maximum range of sizes, colors, textures, and flatness. Tiles delivered to the job or installed in the Work, and which do not fall within the accepted range, shall be removed from the site and be replaced promptly with acceptable materials.
      b. Trim shapes and base: Review any unusual installation conditions with the Architect for approval prior to commencing the work.
   4. **Verify availability of all parts, in all colors required, at time of submittal.**

B. Contract Closeout Submittals: Submit in accordance with Section 01 7700.
   1. Manufacturer's recommended cleaning procedures.

1.3 QUALITY ASSURANCE

A. Applicable Standards: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this Specification to the extent they are specified herein. Unless otherwise specified, use the latest edition.
   1. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile - Version; 2014.
   2. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2022.
   3. Tile Council of America (TCA): Comply with the Handbook for Ceramic Tile Installation.

B. Colors: Provide finish selections indicated in the Finish Schedule.
   1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
   2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s

standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer's "standard colors" from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.

3. Custom Colors: Where the Finish Schedule indicates a specific manufacturer's colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

C. Blending:
1. Require the tile manufacturer to blend tiles at the factory.
2. Provide additional blending at the job site as needed to secure the Architect's approval.
3. All materials of each specific type and color **shall be from the same dye-lot or run.**
4. Provide additional lighting if necessary prior to starting tile installations.

D. Provide only tile cartons which have been grade-sealed by the manufacturer in accordance with ANSI A137.1, and with grade-seals unbroken.

E. On manufactured grouts, provide labels certifying compliance with the referenced standards.

1.4 SITE CONDITIONS

A. Install mortar, and set and grout the tile, only when temperature is at least 50$^{o}$ F and rising in the space.

B. Protection:
1. Protect adjacent surfaces during progress of the work of this Section.
2. Close rooms and spaces to traffic of all types until mortar and grout have set for 72 hours.

C. Illuminate the work area during installation, providing the same level and angle of illumination as will be available for final inspection.

1.5 EXTRA MATERIALS

A. Materials: Provide for the Owner's use, an extra stock of approximately 3% of each type, color, pattern, and size of material installed. Package each type of material separately, distinctly marked, and protected against deterioration and damage.

B. Deliver materials to the Inspector of Record along with an inventory list of items provided. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01620.

B. Manufacturers: As indicated on the Finish Schedule.

2.2 CERAMIC TILE

A. Except as may be otherwise specified or approved by the Architect, provide floor tiles **with coefficient of friction of 0.42** or higher in accordance with pertinent provisions of ASTM C1028.

B. Ceramic Mosaic Floor Tile, Unglazed:
   1. Type: Ceramic Mosaic
   2. Size: 2"x 2"
   3. Catalog number and/or color: See Finish Schedule
   4. **Note:** Provide ceramic mosaic with 7.5% abrasive content at shower floors.

C. Interior Wall Tile, Glazed:
   1. Type: Glazed Ceramic
   2. Size: 4-1/4" x 4-1/4"
   3. Catalog number and/or color: See Finish Schedule

D. Exterior Wall Tile, Clearglazed:
   1. Type: Glazed Porcelain
   2. Size: 3" x 3" with 1/8" grout joints
   3. Colors: D175 - 50%, D322 - 30%, D179 - 20%, with Prism #502 grout by Custom Building Products.
   4. Pattern: Random blend.

E. Provide standard trim shapes as required.
   1. Provide all bases, caps, stops, returns, trimmers, and other shapes indicated or required to produce a completely finished installation.
   2. Unless otherwise noted on the Drawings, provide color and finish matching the adjacent tile.
   3. **All interior and exterior wall corners shall be standard bullnose units** unless otherwise noted.
   4. Verify with Architect any conflicting conditions prior to installation.

2.3 INSTALLATION MATERIAL

A. All materials, including mortar bed, metal lath, membranes, bond coats, etc. shall be in strict compliance with the CTA Handbook for Ceramic Tile Installation.

B. Portland Cement Mortar Bed: Provide materials in accordance with ANSI A108.1 and the TCA setting method specified below.
   1. Membrane: 15 pound roofing felt or 4 mil polyethylene film (required in wet areas only)
   2. Portland Cement: ASTM C150, Part 1.
   3. Lime: ASTM C206, Type S or ASTM C207, Type S.
   4. Sand: ASTM C144.
   5. Water: Potable.

C. Bond Coat:
   1. Latex-Portland Cement Mortar: ANSI A118.4. Ardex X77 Microtec fiber reinforced tile and stone mortar by Ardex Americas, Super Flex by TEC, ReFlex by Bostik, 254/255 by Laticrete, or Kerabond/Keralastic by Mapei, with manufacturers recommended acrylic latex additive.
   2. Epoxy: 100% solids; chemical, stain, and shock resistant; ANSI A118.3. Ardex WA Epoxy adhesive and grout by Ardex Americas, AccuColor EFX Epoxy by TEC, ExPoxy Ezclean by Bostik, Latapoxy 300 by Laticrete International, or Kerapoxy by Mapei Corp.

D. Grout:
   1. Epoxy Grout: 100% solids; chemical, stain, and shock resistant; ANSI 118.3. Ardex WA Epoxy grout and adhesive by Ardex Americas, AccuColor EFX Epoxy by TEC, EzPoxy Exclean by Bostik, Latipoxy 300 by Laticrete, or Kerapoxy by Mapei.

2.4 METAL TRIM

A. Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive; by Schluter-Systems or Profilitec.
   1. Applications:
      a. Open edges of wall tile.
      b. Open edges of floor tile.
      c. Wall corners, inside and outside.
      d. Transitions between floor finishes of different height.
      e. Thresholds at door openings.
      f. Borders and other trim as indicated on the Drawings.

2.5 CAULKING

A. Ceramic Tile Caulk:
   1. Sanded: Polyblend Ceramic Tile Caulk by Custom Building Products, Ardex SX 100% Silicone sealant for tile and stone by Ardex Americas or approved equal.
   2. Non-Sanded: Polyblend Ceramic Tile Caulk by Custom Building Products, Ardex SX 100% Silicone sealant for tile and stone by Ardex Americas or approved equal.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. **Do not proceed until unsatisfactory conditions are corrected.**

B. Coordinate with other trades as needed to assure that proper substrata are provided to receive the work of this Section.

C. Where a Portland cement mortar setting bed will be installed, do not commence installation of the setting bed until substrata are within the following tolerances:
   1. Horizontal surfaces: Level within 1/4" in ten ft in all directions;
   2. Vertical surfaces: Plumb within 1/4" in eight ft in all directions.

D. Where tile units will be thin-set directly to the substrata, do not commence installation of the tile units until substrata are within the following tolerances:
   1. Horizontal surfaces: Level within 1/8" in 10'-0" in all directions;
   2. Vertical surfaces: Plumb within 1/8" in 8'-0" in all directions.

E. Condition of surfaces to receive tile:
   1. Verify that surfaces to receive mortar setting bed and tile are firm, dry, clean, and free from oily or waxy films and curing compounds.
   2. Verify that grounds, anchors, plugs, recess frames, bucks, electrical work, mechanical work, and similar items in or behind the tile have been installed before proceeding with installation of mortar bed or tile.

F. Tile at Dissimilar Materials:
   1. Where tile will be set over dissimilar substrates, i.e. wood and masonry in the same plane, provide and install Dal-Seal CIS - Crack isolation sheet membrane, or approved equal.
   2. Provide for 1/4" full depth gap between tile and metal door frames. Fill with mildew resistant silicone sealant.
   3. Provide for movement of dissimilar substrate materials by using mildew resistant silicone sealant at nearest grout joint.

3.2 SETTING METHOD

A. Use setting method of the types indicated and required in accordance with TCA Handbook of Ceramic Tile Installation as specified below.

B. Interior Walls:
1. **Wood or Metal Stud with Mortar Bed:** W231 with latex Portland cement bond coat on a cured mortar bed; membrane, plain lath, mortar bed and scratch coat - ANSI A108.1A, tile - ANSI A108.1B, and grout - ANSI A108.3. Provide expansion joints and cold joints at all interior and exterior corners in accordance with TCA Movement Joint Design Essentials EJ171.

C. Interior Floors:
1. **Concrete:** F112 with latex Portland cement mortar bond coat on a cured mortar bed; mortar bed bond coat, mortar bed - ANSI A108.1a, tile - ANSI A108.1B, and grout - ANSI A108.3.
2. **Concrete (Thin-set):** F115 with epoxy cement bond coat; bond coat - ANSI A118.4, tile - ANSI A108.1B, and grout - ANSI A108.3. Provide expansion joints and cold joints at all interior and exterior corners in accordance with TCA Movement Joint Design Essentials EJ171.

D. Interior Base Only, No Wall Tile Above:
1. **Studs and Gypsum Board:** W221 with latex Portland cement mortar bond coat on a cured mortar bed; membrane, self-furring metal lath, mortar bed with scratch coat - ANSI A108.1B, tile - ANSI A108.1B, and grout - ANSI A108.10.

3.3 TILE INSTALLATION

A. General:
1. **Prior to installation, verify layout of patterns and transitions with the architect for approval.**
2. Comply with pertinent provisions of the referenced standards and the product manufacturer's installation recommendations, except as otherwise directed by the Architect or specified herein.
3. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.
4. Do not install tile floors over membrane until the membrane has been tested and accepted.
5. Mix and use proprietary materials in strict accordance with the manufacturers' printed instructions.
6. Prepare the surfaces, set, fit, grout, and clean the work of this Section in strict accordance with the referenced standards and the manufacturers' recommendations.
7. Provide adequate lighting to assure workman visibility for uniform tile setting.

B. Install in accordance with pertinent provisions of the standards listed in 1.3 above, pressing and beating tile into place to obtain 100% coverage by mortar on back of each tile. Back-butter tiles if necessary to achieve 100% coverage.

C. Limits of Tile:
1. Extend tile into recesses and under equipment and fixtures to form complete covering without interruptions.
2. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.

D. Joining Pattern:
1. Lay tile in grid pattern unless otherwise indicated on the Drawings or directed by the Architect.
2. **Align joints** when adjoining tiles on floor, base, trim, and walls are the same size.
3. Layout tile work, and center the tile fields both directions in each space or on each wall area.
4. Adjust to minimize tile cutting.
5. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size.

6. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

E. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes, and alignments shown:
   1. Horizontal surfaces: 1/8" in ten ft in all directions;
   2. Vertical surfaces: 1/8" in eight ft in all directions;
   3. Adjacent tiles flush.

## 3.4 THRESHOLDS

A. EDGE STRIPS: Install edge strips at openings where threshold has not been called for, but where tile floor abuts other flooring material at same level.

B. Where thresholds are detailed to be installed over tile, install with a full bedding of bonding mortar.

## 3.5 GROUTING

A. General:
   1. Do not begin grouting floor tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed.
   2. Remove spacers, ropes, glue, and similar foreign matter prior to grouting.
   3. When using proprietary grout, adhere strictly to the manufacturer's directions unless otherwise specified or approved by the Architect.

B. Installation:
   1. Mix grout by hand or with a slow-speed drill motor not exceeding 300 rpm, achieving a stiff non-slumping, uniform consistency, and using the minimum amount of liquid to achieve a workable mix.
   2. Force the maximum amount of the approved grout into joints in accordance with pertinent recommendations contained in ANSI standards specified.
   3. Fill the joints of cushion-edge tile to depth of the cushion; fill joints of square-edge tile flush with the surface.
   4. Fill all gaps and skips.
      a. Do not permit mortar or mounting mesh to show through grouted joints.
      b. Provide hard finished grout which is uniform in color, smooth, and without voids, pin holes, or low spots.
   5. Leave tile clean.

## 3.6 CAULKING

A. Locations:
   1. Caulk all tiled inside and outside corners with sanded caulking, color to match grout, in lieu of grout.
   2. Caulk transition from wall tile to ceiling and wall with sanded caulking, color to match grout, in lieu of grout.
   3. Caulk intersection of wall and ceiling tile to door and window frames with sanded caulking, color to match grout, in lieu of grout.

## 3.7 CURING

A. Damp cure all tile installations, including portland cement grouts, for 72 hours minimum.
   1. Cover with 40 pound kraft paper.
   2. Do not use polyethylene sheets directly over tile on horizontal surfaces.

## 3.8 CLEANING AND POLISHING

A. After completion of setting and grouting, thoroughly clean and polish the tile.
   1. Do not use acid or acid cleaners to clean tile.
   2. When epoxy resin grout is thoroughly cured, steam clean paraffin coating per manufacturer's recommendations.
   3. When the tile is thoroughly clean and dry, polish glazed tile with clean dry cloths.

3.9 PROTECTION AND REPLACEMENT

A. Protect finished tile work while other work in the area is in progress. Do not permit traffic on tile floors for 7 days after laying tile. Protect tile floors from traffic with heavy, non-staining paper held in place with non-staining masking tape.

B. Replace cracked, chipped, broken, and otherwise defective tiles.

C. Remove work not complying with requirements of the Contract Documents or the referenced standards, and promptly replace with work which does comply.

**END OF SECTION 09 3000**

**SECTION 09 5100 - ACOUSTICAL CEILINGS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide acoustical ceilings where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 01 3560: High Performance Criteria Summary
3. Section 09 2900: Gypsum Wallboard System

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Samples: Submit four 4" x 4" samples of all acoustic ceiling tiles and/or panels specified. Submit two samples of all ceiling suspension system components. If other than components and manufacturer specified are submitted, provide four samples of each component system.

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
1. Manufacturer's recommended cleaning procedures.

1.3 QUALITY ASSURANCE

A. Comply with ASTM C636 and E580, CBC Section 1616A1.21 and DSA IR 25-2.13.

B. Fire Performance Characteristics: Provide acoustical ceiling components identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by an independent testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of testing and inspection agency.
1. Surface Burning Characteristics:
a. Flame Spread: 0-25; ASTM E84.
b. Smoke Developed Index: 0-450; ASTM E84.

C. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings at no additional costs to the Owner.
3. Custom Colors: Where the Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable at no additional costs to the Owner.

D. Ceiling grid installer shall coordinate with General Contractor to insure that substrates at the ceiling line are within a tolerance of straight, not-to-exceed 1/8" in 10', as indicated by a 10' straight edge. General Contractor shall shim as required prior to ceiling installer accepting substrates. Failure to maintain the tolerances will require removal and reinstallation at no additional cost to the Owner.

1.4 EXTRA MATERIALS

A. Materials: Provide for the Owner's use, an extra stock of 2 full boxes of each type, color, pattern, and size of material installed. Package each type of material separately, distinctly marked, and protected against deterioration and damage.

B. Deliver materials to the Inspector of Record along with an inventory list of items provided. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 SUSPENDED ACOUSTICAL CEILING SYSTEM

A. Suspension Systems: ASTM C635 and E580 Section 5; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required for a complete suspension system.

B. Acceptable Suspension System Products:
1. Series 1250 heavy-duty by Chicago Metallic Corp., ESR-2631:
   a. Main runner: No. 270.
   b. Cross runner: No. 1254 or 1274.
   c. Perimeter clip: No. 1496.
2. Prelude XL Heavy-duty by Armstrong, ESR-1308:
   a. Main runner: No. 7301.
   b. Cross runner: No. XL-7342.
   c. Perimeter clip: BERC-2.
3. Color:
   a. White at 2' x 4' grid

C. Acceptable Acoustical Ceiling Panel Products: ASTM E1264, Class A.
1. **Type "B":** School Zone Fine Fissured - No. 1714 (NRC 0.70) by Armstrong; 24"x48"x3/4"; square edge lay-in; flame spread 0-25; color white.
2. **All acoustical ceiling panels within the same room shall come from the same die lot.**

2.3 ACCESSORIES

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. Adhesive: Titebond Acoustical Ceiling Tile Construction Adhesive or approved equivalent.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.3 SUSPENSION SYSTEM INSTALLATION

A. Except as modified by requirements of governmental agencies having jurisdiction, recommendations of the manufacturer as approved by the Architect, or specific directions of the Architect, install in accordance with ASTM C636 and E580 Section 5, CBC Section 808, and pertinent UL design requirements.

B. Hanger Wires:
1. Provide 12 gauge minimum hanger wires for up to and including 4'-0" x 4'-0" grid spacing along main runners. Splices are not permitted in any hanger wires unless specifically approved by DSA.
2. Provide 12 gauge hanger wires at ends of all main and cross runners within 8" from the support and within 1/4 of length of end tee, whichever is least, for perimeter of ceiling area. End connections for runners which are designed and detailed to resist the applied horizontal forces may be used in lieu of 12 gauge hanger wires, subject to DSA review and approval.
3. Provide trapeze or other supplementary support members at obstructions to main hanger spacing.
4. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas.
5. Provide counter-sloping wires for hanger wires which are more than 1 in 6 out of plumb.

C. Perimeter Attachment:
1. Ceiling grid members may be attached to not more than two adjacent walls. Ceiling grid members shall be at least 3/4" free of other walls. If walls run diagonally to ceiling grid system runners, one end of main and cross runners shall be free and a minimum of 3/4" clear of wall.
2. At perimeter of ceiling area where main or cross runners are not connected to adjacent wall, provide interconnection between runners at free end to prevent lateral spreading.
    a. Metal strut or a 16 gauge wire with a positive mechanical connection to the runner may be used.
    b. Where the perpendicular distance from the wall to the first parallel runner is 12" or less, this interlock is not required.

D. Bracing Wires: Provide sets of four 12 gauge splayed bracing wires oriented 90 degrees from each other at following spacing:
1. Provide sets of bracing wires at a spacing not more than 12'-0" x 12'-0" on center.
2. Provide bracing wires at locations not more than 6'-0" from each perimeter wall and at edge of vertical ceiling offsets.
3. Slope of splayed bracing wires shall not exceed 45 degrees from plane of ceiling and shall be taut without causing ceiling to lift. Splices in bracing wires shall not to be permitted without special DSA approval.
4. Fasten a strut to main runner at the convergence of the splayed wires, extended to and fastened to roof or floor structural members above or to such other framing deemed acceptable to enforcement agency.
    a. Place these vertical restraint points not more than 12'-0" x 12'-0" on center.

b. Provide vertical struts at locations not more than 6'-0" from each perimeter wall and at the edge of vertical ceiling offsets.

E. Hanger and Bracing Wire Fastening:
1. Fasten hanger wires with not less than 3 tight turns.
2. Fasten bracing wires with 4 tight turns.
3. Make all tight turns within a distance of 1-1/2 inches.
4. Install hanger or bracing wire anchors to the structure in such a manner that the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire.

F. Hanger and Bracing Wire Separation: Separate all ceiling hanging and bracing wires at least 6 inches from all unbraced ducts, pipes, conduit, etc. It is acceptable to attach lightweight items, such as single electrical conduit not exceeding 3/4 inches nominal diameter, to hanger wires using connectors acceptable to DSA.

G. Light Fixtures:
1. Attach all light fixtures to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures.
2. Flush or recessed light fixtures and air terminals or services weighing **less than 56 pounds** may be supported directly on the runners of heavy-duty grid system but, in addition, shall have a minimum of two 12 gauge slack safety wires attached to fixture at diagonal corners and anchored to structure above. All 4'-0" x 4'-0" light fixtures shall have slack safety wires at each corner.
3. All flush or recessed light fixtures and air terminals or services weighing **56 pounds or more** shall be independently supported by not less than 4 taut 12 gauge wires each attached to fixture and to structure above regardless of the type of ceiling grid system used. The four taut 12 gauge wires, including their attachment to the structure, above shall be capable of supporting four times weight of the unit.

4. Support surface mounted light fixtures by at least 2 positive devices which surround the ceiling runner and which are each supported from 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 8'-0" or longer.

H. Wall Angles:
1. Install wall angles and edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
2. Screw attach moldings to substrate at intervals not over 16" on center and not more than 3" from ends.
3. Leveling with ceiling suspension system to tolerance of 1/8" in 12'-0".
4. Miter corners accurately and connect securely.

## 3.4 ACOUSTICAL CEILING PANEL INSTALLATION

A. Arrange acoustical units and orient directionally-patterned units with pattern running in one direction.

## 3.5 CLEANING UP

A. In addition to other stipulated requirements for cleaning, completely remove finger prints and traces of soil from the surfaces of grid and acoustical materials, using only those cleaning materials recommended for the purpose by the manufacturer of the material being cleaned.

B. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION 09 5100**

## SECTION 09 6110 - MOISTURE CONTROL TREATMENT FOR FLOORING

### PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide moisture control treatment applied over new or existing interior concrete slabs where resilient flooring and carpeting are indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.
2. The Owner's independent testing laboratory shall conduct vapor emission, relative humidity, and pH testing before application of the moisture control treatment as specified herein.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 03 3300: Cast-in-place concrete floor slabs.
3. Section 09 0560: Common work results for flooring preparation; pH, relative humidity, and vapor emission testing.
4. Section 09 6500: Resilient flooring.
5. Section 09 6800: Carpeting.

1.2 ALLOWANCES

A. Not Applicable.

1.3 DEFINITIONS

A. As used in this Section, "pounds" shall be defined as "pounds of water per 1,000 square feet per 24 hour period" as described in ASTM E907 and F1869.

B. Alkalinity shall be expressed as a "pH range of 1-14" as described in ASTM F710.

1.4 SYSTEM DESCRIPTION

A. Moisture control treatment shall form adhesion to damp, dry and wet concrete surfaces to restrict water vapor emission levels to a maximum of 3.0 pounds and allow adhesion to alkaline environments.

B. Moisture control treatment shall be compatible with all types of floor covering products and systems.

C. Application includes:
1. Concrete preparation
2. Moisture control treatment, minimum of 2 coats.
3. Cementitious top coat under carpet and resilient flooring.

1.5 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.

3. Installer Certification: Submit wet signature certification from manufacturer certifying that Installer is approved by manufacturer for installation of specified system for this project and is certified to install each component of the specified system.
4. Certified Testing: Submit manufacturers ASTM performance testing completed within 3 years of project application per ASTM E96, ASTM D1308, and ASTM D4541.
5. Warranty: Submit a copy of the actual warranty which will be issued for the Work; a sample warranty will not be acceptable. Submit full disclosure of all warranty exclusions and conditions. When warranty exclusions and conditions are not written on the actual warranty document, submit separate endorsement.

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
1. Special Warranty: In addition to the warranty requirements of the Contract Documents, provide manufacturer's 10-year labor and material warranty.
2. Installer Certification: Provide certification signed by the system installer and countersigned by the system manufacturer certifying that the moisture control treatment was installed in accordance with the Contract Documents and the manufacturer's written instructions.

1.6 QUALITY ASSURANCE

A. Manufacturer: Firm regularly engaged in manufacture of moisture control treatment.

B. Installer: Company specializing in application of moisture control treatment, trained by the manufacturer of the products, and certified to install each component of the specified system.
1. Provide references including project name and location, telephone number and name of Owner and General Contractor, size of project, and date of completion.
2. Evidence of success shall include project pictures and pH and calcium chloride test results performed by an independent testing laboratory after installation of the system.

C. Environmental Requirements: Material and equipment shall comply with current regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).

1.7 PREINSTALLATION MEETING

A. Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.8 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, provide a 10-year labor and material warranty, non-prorated.

B. Application of product shall yield water vapor emission, relative humidity, and an alkalinity rate less than flooring manufacturer tolerances during the warranty period.

C. The manufacturer shall warrant the moisture control treatment against failure due to alkalinity and/or moisture emanating from the concrete. Warranty shall cover labor and material for repair or replacement of treatment, floor coverings or resinous materials, adhesives and patching compounds damaged by moisture, alkalinity, or improper system application at no cost to Owner.

E. Warranty shall not exclude concrete shrinkage cracks after application, non-compatibility with specified admixtures, concrete silicates or resin treatments, or ACI 318 or ACI 201 limitations.

F. Warranty shall be extended to future flooring updates or changes a cementitious topcoat is applied. Moisture control treatment manufacture shall provide written acceptance of the flooring change.

## PART 2 - PRODUCTS

2.1 MOISTURE CONTROL TREATMENT

A. Moisture Control Treatment: Manufacturer's formulation of chemicals and resins mechanically restricting water vapor emission up to 95%, capillary action of up to 25.0 lbs., alkaline resistant; and capable of application on damp, dry and wet concrete substrates; crack treatment; minimum thickness recommended by the manufacturer.
1. Synthetic30fs by Synthetics International, (866) 646-0356.
2. Diamond-VRS by Diamond Stone Products, LLP, (888) 817-8663.
3. Vapor-Guard DC by Advanced Moisture Control, (949) 788-1490.
4. VAP I 2000 by Koester American Corporation, (757) 425-1206.
5. Substitutions: Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Physical Characteristics:
1. ASTM E96 Water Vapor Transmission, wet method: 0.60 US perms.
2. ASTM D4541 Concrete Adhesion: 600 psi (100% concrete cohesive failure).
3. ASTM D1308 Acid/Alkali Resistance: 14pH solution - 100% Resistant.
4. ASTM F1869 Calcium Chloride Testing: 3.0 pounds per 1,000 square feet or less.

2.2 CEMENTITIOUS TOP COAT

A. Self-leveling, Portland cement based coating, minimum 4,000 psi at 28 days, as recommended by moisture control treatment manufacturer to provide a smooth flooring substrate.

## PART 3 - EXECUTION

3.1 VAPOR EMISSIONS, RELATIVE HUMIDITY, AND ALKALINITY PRE-TESTING

A. The Owner’s independent testing shall provide testing materials and conduct vapor emissions, relative humidity, and pH (alkalinity) testing in accordance with Section 09 0560.

B. On the basis of testing results, and at the Owner's direction, proceed with the work of this Section.

3.2 SURFACE PREPARATION

A. Slab surfaces shall be solid, free from loose particles, cracks, pits rough projections, and foreign matter detrimental to the vapor emissions and alkalinity control system.

B. Cracks, joints, low spots, and high spots shall be prepared as recommended by the system manufacturer.

C. Shot blast concrete surfaces to remove surface contaminates, curing products, and hard dense non-porous layers to an ICRI#3 (100 grit) texture. Grind near walls and edges by industrial grinder with vacuum connection. Vacuum and remove dust, sand and debris.

D. Vacuum, blow and remove dust, sand and debris from slab surface and joints.

3.3 MOISTURE CONTROL TREATEMENT INSTALLATION

A. Joint and Crack Treatment: Coat cracks and joints. Apply manufacturer approved crack and joint compound in accordance with manufacturer's installation instructions.

B. Apply moisture control treatment product over entire surface to produce maximum penetration, alkalinity resistance and specified vapor reduction level in accordance with the manufacturer's written instructions. Coverage rate shall be as recommended by the manufacturer.

C. Cementitious Topcoat: Apply at a rate of up to 1/8" thickness to promote flooring adhesion using a non-porous primer. Primer shall be capable of securing product to moisture control treatment surface.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Manufacturer's representative shall visit the construction site for:
   1. Preinstallation meeting; and
   2. During installation to inspect product installation for compliance with the manufacturer's instructions.

3.5 PROTECTION

A. Protect the finished installation from damage.

B. Repair damage to moisture control treatment surfaces prior to installation of finished flooring.

**END OF SECTION 09 6110**

**SECTION 09 6500 - RESILIENT FLOORING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide resilient flooring, base, and accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 09 0560: Floor preparation and moisture testing.
2. Section 09 6110: Moisture control treatment (contract allowance).

**C. Special Coordination Requirements: Coordinate finish flooring manufacturer's concrete slab requirements with the work of Section 03 3000 - Cast-in-Place Concrete.**

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Samples: Submit 4 samples of each resilient flooring product specified on the Finish Schedule (including rubber transition strips).

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
1. Manufacturer's recommended cleaning procedures.

1.3 QUALITY ASSURANCE

A. Fire Test Performance: Provide resilient flooring which complies with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.
1. Critical Radiant Flux (CRF): Not less 0.45 watts / sq. cm.; ASTM E648.
2. Flame Spread: Not more than 75 per ASTM E84.
3. Smoke Developed: Not more than 450 per ASTM E84.
4. Smoke Density: Not more than 450 per ASTM E662.

B. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer’s Standard Colors and Finishes: Where Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.
3. Custom Colors: Where Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.4 EXTRA MATERIALS

A. Materials: Provide for the Owner's use, an extra stock of materials as follows:

1. Tile Products: Provide an extra stock of approximately 5% of each type, color, pattern, and size of material installed.
2. Base, Edge, and Stair Tread/Nosings: Provide an extra stock of approximately 5% of each type, color, and size of material installed.
3. Package separately, distinctly marked, and protected against deterioration and damage.

B. Deliver materials to the Inspector of Record along with an inventory list of items provided. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

## PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Provide colors and patterns as selected by the Architect from standard colors and patterns of the approved manufacturer in the specified type.

C. Except as may be otherwise specified or approved by the Architect, provide resilient flooring **with coefficient of friction of 0.60** or higher; ASTM D2047.

D. High Performance Criteria: See Section 01 3560.

2.2 RESILIENT MATERIALS

A. Luxury Vinyl Tile:
1. Dimension: 4" x 36" x 1/8".
2. See Finish Schedule for types and patterns.
3. Coefficient of friction greater than 0.5 per ASTM D2047.

2.3 RESILIENT ACCESSORIES

A. Resilient Base: ASTM F 1861, Type TS rubber, vulcanized thermoset; top set Style B cove, by Roppe.
1. Size and color as shown on Drawings and Finish Schedule.
2. Provide longest lengths possible for minimum splicing. Provide premolded corners at outside square corners, including base cabinet alcoves and outside corners.
3. Provide continuous base around radius corners to a minimum of 6" before any splice.

2.4 OTHER MATERIALS

A. Provide edge strips and other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. Adhesives: Provide waterproof and stabilized type adhesive as recommended by the manufacturer of the resilient materials; low-VOC.
1. Allowable moisture limit of 90% internal relative humidity.
2. Appropriate for the pH conditions of the substrate.

C. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109 or ASTM C472, whichever is appropriate.

D. Concrete Slab Primer: Provide non-staining type as required and as recommended by the manufacturer of the material being installed.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

D. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and Ph.
1. Test in accordance with Section 09 0560.
2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
3. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 0560.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Concrete Subfloors:
1. Verify that substrate is smooth, level, at required finish elevation, and without more than 1/8" in 10'-0" variation from level or slopes shown on the Drawings.
2. Clean cracks, control joints, and other non-moving joints.
3. Broom clean or vacuum the surfaces to be covered, and inspect the subfloors.
4. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
5. Seal patching compound with sealer recommended by the manufacturer and compatible with the flooring products specified.
6. Do not fill expansion joints, isolation joints, or other moving joints.
7. Prohibit traffic until patching compound is cured and sealed.

D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION

A. General:
1. Install materials only after finishing operations, including painting, have been completed and after permanent air conditioning system is operating.
2. Maintain reference markers, holes, and openings that are in place or plainly marked for future cutting by repeating on the finish surface as marked in the subfloor. Use chalk or other non-permanent marking device.
3. Inspect flooring materials to be installed. Defective materials will be subject to rejection and such rejection shall not be considered as grounds for additional compensation or time extension.

B. Starting installation constitutes acceptance of sub-floor conditions.

3.4 BASE INSTALLATION

A. Installation:
1. Install base where indicated on drawings.
2. Use factory-preformed exterior corners at square vertical outside corners only and factory-preformed or job-mitered interior corners.
3. Apply adhesive to insure contact not more than 1/4" from top of base.
4. Apply base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required.
5. Provide minimum length pieces of 12".
6. Take precautions to eliminate telegraphing of adhesive through the surface of installed base material.

3.5 CLEANING AND PROTECTING

A. Remove excess adhesive and other blemishes from exposed surfaces, using neutral cleaner recommended by the manufacturer of the resilient materials.

B. Resilient Tile:
1. Strip, seal, wax and buff finished flooring to a clean and uniform appearance as recommended by the manufacturer, using stripper and wax as approved by the Owner.
2. Provide the manufacturer's recommended number of coats of recommended sealer/wax on floor, then buff to a uniform appearance.

**END OF SECTION 09 6500**

**SECTION 09680 - CARPETING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide carpeting and carpet accessories as specified herein, and as needed for a complete and proper glue-down installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
1. Section 09 0560: Floor preparation and moisture testing.
2. Section 09 6110: Moisture control treatment.

**C. Special Coordination Requirements: Coordinate finish flooring manufacturer's concrete slab requirements with the work of Section 03 3000 - Cast-in-Place Concrete.**

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Submit 3 copies of flammability rating for each type of carpet used.
3. Installation Procedures: Submit manufacturer's recommended installation procedures.
4. Samples: Submit 4 samples (12" x 12" each) of the carpets specified on the Finish Schedule.
5. Shop Drawings: Submit shop drawings showing location of seams and locations and types of carpet metal and accessories for Architect's approval.

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
1. Manufacturer's recommended cleaning procedures.

1.3 QUALITY ASSURANCE

A. Flammability Rating: CBC Section 804.
1. Carpet Wainscot shall have a flame spread of 25 or less, Class A.
2. Flooring Carpet shall have a flame spread of 75 or less, Class B.
3. Minimum Critical Radiant Flux: Class II.

B. Accessibility: Provide glue-down or firm cushion installation that complies with CBC Section 11B-302.2.
1. Level loop, textured loop, level-cut, or level-cut/uncut pile texture and maximum pile height of ½".
2. Carpet edges shall comply with CBC Section 11B-303.

C. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s standard color or finish, Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.
3. Custom Colors: Where Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.4 SPECIAL WARRANTY

A. Wear Warranty: Submit 3 original copies of the manufacturer's **10-year** Edge Ravel and Delamination Warranty, **10-year** Color Fastness Warranty and Wear Warranty. The warranties shall be dated, referenced to this project, and directed to the subcontractor and Contractor. They shall be signed by the carpet manufacturer, territorial representative, and the technical department head.

B. Special Project Warranty: In addition to the warranty requirements of the Contract Documents, submit 3 original copies of a special project warranty signed by the subcontractor/installer and the Contractor providing an extended correction period of **2 years**.

1.5 EXTRA MATERIALS

A. Materials: Provide for the Owner's use, an extra stock of approximately 2% of each type, color, and pattern of material installed and in addition, allow Owner to inspect and select from scrap carpet pieces remaining after installation. Bundle and wrap in burlap all extra material and Owner selected scraps.

B. Deliver materials to the Inspector of Record along with an inventory list of items provided. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01620.

2.2 CARPET

A. Provide carpets, colors as noted on Finish Schedule.

B. Provide all material from a single dye-lot.

2.3 RESILIENT ACCESSORIES

A. Refer to Resilient Flooring Specifications 09 6500 for Topset Rubber Base.

2.4 OTHER MATERIALS

A. Adhesives: Provide waterproof and stabilized type adhesive as recommended by the manufacturer of the resilient materials; low-VOC.
   1. Allowable moisture limit of 90% internal relative humidity.
   2. Appropriate for the pH conditions of the substrate.

B. Provide seam adhesive as recommended by the manufacturer.

C. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 SURFACE PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 0560.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Immediately prior to installation of the work of this Section, thoroughly clean substrata and remove oil, grease, paint, varnish, hardeners, and other items which would adversely affect the bond of adhesive.

D. Make substrata level and free from irregularities. Assure one constant floor height after carpet is installed, filling low spots and grinding high spots as required.

3.3 CARPET INSTALLATION

A. General:
1. Glue directly to the floor, using no pads and no foam.
2. Scribe the carpet accurately to vertical surfaces.
3. Align the lines of carpet, as woven, using no fill strips, laying all carpet in the same direction unless specifically directed otherwise by the Architect.
4. Where carpeting is used on the walls, install as directed by the manufacturer, and trim all edges with a silver cap approved by the Architect.

B. Seams:
1. Locate seams only where shown on the approved Shop Drawings, or where specifically otherwise approved by the Architect.
2. Locate seams to the maximum extent practicable out of the way of traffic.
3. Fabricate seams by the compression method, using a butt joint, and properly bead and seal.
4. Do not stretch seams.

C. In addition to the cleaning requirements stated elsewhere, thoroughly clean carpet and adjacent surfaces prior to final acceptance of the carpeted areas by the Owner.

3.4 PROTECTION

A. Provide a heavy non-staining paper or plastic walkway as required over carpeting in direction of traffic, maintaining intact until carpeted space is accepted by the Owner.

**END OF SECTION 09 6800**

**SECTION 09 7720 - VINYL-COVERED TACKBOARD PANELS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide vinyl covered tackboard where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Work: Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and sections in Division - 1 of these specifications.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Submit manufacturer's recommended installation procedures.
   3. Samples: Submit 4 samples of each vinyl-covered tackboard specified on the Finish Schedule.

B. Contract Closeout Submittals: Manufacturer's recommended cleaning procedures.

1.3 QUALITY ASSURANCE

A. Provide each type of tackboard as produced by a single manufacturer including recommended primers, adhesives, and sealants.

B. Colors: Provide finish selections indicated in the Finish Schedule.
   1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
   2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.
   3. Custom Patterns and Colors: Where the Finish Schedule indicates a specific manufacturer’s pattern and/or colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.4 EXTRA MATERIALS

A. Materials: Provide for the Owner's use, an extra stock of approximately 10% of each type, color, and pattern of material installed with an appropriate amount of the proper adhesive. Package each type of material separately, distinctly marked, and protected against deterioration and damage.

B. Deliver materials to the Inspector of Record along with an inventory list of items provided. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

## PART 2 - PRODUCTS

2.1 MATERIALS

A. Acceptable Manufacturers:
1. Koroseal, (888) 520-2810.
2. Global Products Tackboard by Western Building Materials, (559) 454-8500.
3. Lamvin Inc., (800) 446-6329.
4. Chatfield-Clarke, (714) 823-4297.
5. Nelson Adams (NACO), (909) 879-0421.
6. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Vinyl Covered Tackboard:
1. Vinyl Wall Covering:
a. Heavy duty (VWC-MD), Type II, total weight not less than 20 oz. per sq. yd., vinyl coating with Koroklear coating, fabric backing of osnaburg or drill.
b. Pattern/texture: Woven fabric look.
c. Color: As indicated on the Finish Schedule.
2. Panel Sizes: 1/2” thick; 8, 9 or 10 foot lengths (as required for minimum horizontal joints); depending on ceiling height; width of 48" minimum; cut panel size in any direction.

C. Flame Spread Characteristics: Provide materials bearing UL label and marking indicating fire hazard classification of wall covering as determined by ASTM E84 or UL 723. Provide materials with the following flame spread ratings:
1. Vinyl Covering: Class A; Flame spread of 25 or less, smoke-developed less than 450.

D. Accessory items:
1. Adhesives: Provide manufacturer's recommended adhesive, primer, and sealer, produced expressly for use with selected wall covering on substrate as shown on drawings. Provide materials which are mildew-resistant and non-staining.
2. Plastic Moldings and Trim: Provide moldings and trim around door and window frames and around all other building features which penetrate vinyl covered tackboard (such as fire extinguisher cabinets).
a. Plastic edge moldings shall be covered with factory applied veneer to match color and texture of vinyl wall covering.
b. Provide plastic moldings at the bottom of tackboard panels where shown in the detail drawings.
c. Provide manufacturers standard moldings for outside and inside corners and end caps at exposed edges.

## PART 3 - EXECUTION

3.1 INSPECTION

A. Examine substrates and conditions under which work of this section will be performed. Correct conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Maintain constant minimum temperature of 60 degrees F (16 degrees C) at areas of installation for at least 72 hours before and 48 hours after application of materials.

B. Illuminate areas of installation using buildings' permanent lighting system; temporary lighting alone will not be acceptable.

C. Acclimatize board materials by removing from packaging in area of installation not less than 24 hours before application.

D. Remove switch plates, wall plates, and surface-mounted fixtures in areas where board is to be applied.

3.3 INSTALLATION

A. All vinyl wall covering shall be factory installed on 1/2" thick tackboard.

B. Corners of edge moldings around doors and windows shall be carefully cut at 45 degrees to provide tight fitting mitered corners. Sloppy corners will be not be permitted. Putty fill of gaps is not acceptable.

C. Provide metal edge moldings at outside corners.

D. Apply glue to backside of panels or to gypsum board in a uniform coat completely covering entire surface. Provide all temporary bracing required to ensure that vinyl covered tackboard is totally adhesive to gypsum board underlayment.

E. Cut the fiberboard backing, where required, so that the vinyl covering is left longer than the backing. Wrap the vinyl around the cut surface and glue. All finished panels shall have all edges wrapped.

F. Where vinyl covered tackboard is to be covered with rubber base, the maximum "gap" between concrete slab and tackboard shall be 3/8" the minimum "gap" shall be 1/8" (to prevent moisture from wicking up into tackboard). Provide non porous (metal or hardwood) backing for rubber base in resulting gap).

G. **Tackboard shall extend behind all blackboards and future cabinet work.** Tackboard **shall not** extend behind cabinet work that is part of this contract unless Drawings say otherwise.

H. Horizontal joints shall not be permitted unless indicated on the Drawings.

3.4 ADJUST AND CLEAN

A. Replace removed plates and fixtures; verify cut edges of wall coverings are completely concealed.

B. Remove surplus materials, rubbish, and debris resulting from wall covering installation upon completion of work, and leave areas of installation in neat, clean condition.

C. Remove and reglue any panels which show movement when "pushed" toward wall plain.

**END OF SECTION 09 7720**

**SECTION 09 7730 - FIBERGLASS REINFORCED PANELS**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide fiberglass wall panels where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 09 9100: Priming of gypsum board and CMU surfaces.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's specifications and other data needed to prove compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.

B. Contract Closeout Submittals: Manufacturer's recommended cleaning procedures.

**PART 2 - PRODUCTS**

2.1 WALL PANELS

A. Textured Gloss Panels shall be finished panels 4' x 8' or 10' x 3/32" as required for installation with no horizontal seams, color as indicated on finish schedule. See Drawings for location.
1. Panels shall be solid fiberglass reinforced polyester construction. Class A; Flame spread of 25 or less, smoke-developed less than 450.
2. Adhesive shall be per manufacturer's standards, meeting requirements of ASTM C557-65T, non-toxic, non-flammable and per State Fire Marshal Standards.
3. Color: As noted on the Finish Schedule

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
1. Glasbord by Crane Composites, Inc.
2. FiberLite FRP - Wall Panels by Nudo.
4. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 OTHER MATERIALS

A. Provide manufacturer's standard prefinished vinyl clad moldings and trim in harmonizing colors at all joints, corners, and edges.

B. Adhesive: Titebond Fast Grab FRP Adhesive or approved equivalent.

**PART 3 - EXECUTION**

3.1 INSTALLATION

A. Securely install panels by adhering to substrate as recommended by the manufacturer. Set panels straight, plumb, level, and true to the lines and levels shown on the Drawings.

B. Install maximum length materials wherever possible.

C. Finish butt joints, wall juncture, wall/ceiling and wall/curb joints with the manufacturer's standard trim pieces and the specified sealant, tooling to a smooth finish.

D. When installed as a wainscot, position panels in a horizontal railroad style to minimize seams.

E. When indicated to be installed backside (smooth side) out, select panels free of mars and scratches.

3.2 CLEANING

A. Upon completion of each buildings work, remove all debris from building and site. Remove all excess mastic and caulking materials from finished surfaces and adjacent surfaces.

**END OF SECTION 09 7730**

**SECTION 09 9100 - PAINTING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. General: Paint and finish all exposed surfaces using the combination of materials listed on Painting Schedule in Part 3 of this Section, as specified herein, and as needed for a complete and proper installation.
   1. Surface preparation, priming, and painting specified in this Section are in addition to shop priming and surface treatment specified in other sections.
   2. Paint exposed surfaces whether or not colors are designated in schedules. Paint exposed surfaces to match adjacent materials or areas, in the color selected by the Architect.
   3. **Painting of Patch Work:**
      a. Drawings do not indicate all existing areas or all portions of individual existing areas required to be painted because of patch work, but give the general intent for the work required.
      b. Paint all new work within previously painted existing areas as part of the work of this Section regardless of the trade installing new work and causing patching work.
      c. Paint entire overall surface from corner to corner regardless of the extent of new work and patch work.
      d. In existing areas where 2 or more walls or 1 wall and 1 ceiling surface are new or require painting because of patching, paint entire area including all new work and all previously painted existing surfaces.

B. Work Included: The following list is not totally inclusive and does not exclude work not stated herein but required to be painted in the specifications, Finish Schedule, and drawings. Unless otherwise specified, work to be painted under this Section includes, but is not limited to:
   1. Work specifically noted as requiring a paint finish in the drawings and specifications, and on the Finish Schedule.
   2. Wood trim.
   3. Interior and exterior ferrous metal.
   4. Interior and exterior galvanized metal.
   5. Galvanized flashings and sheet metal.
   6. Metal doors and frames.
   7. Wood doors.
   8. Cement plaster.
   9. Gypsum board.
   10. Acoustical ceilings/surfaces.
   11. Exposed surfaces of glazing stops, including those visible after glazing is installed.
   12. Exposed mechanical items including:
      a. Piping, pipe hangers, and supports.
      b. Tanks.
      c. Ductwork and insulation.
      d. Mechanical equipment, and supports.
      e. Accessory items.
   13. Exposed electrical conduit, raceways, fittings, panels, and switchgear.

C. Work Not Included:
   1. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.
   2. Surfaces of prefinished metals, anodized aluminum, stainless steel, chromium plate, copper, bronze, and

similar finished materials will not require painting under this Section unless indicated on the Drawings.
3. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts, unless otherwise indicated.
4. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
5. Do not paint concrete which has been sandblasted unless specifically noted for painting.
6. Do not paint galvanized gratings.

D. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Priming or priming and finishing of certain surfaces may be specified to be factory-performed or installer-performed under pertinent other Sections.
3. Section 07 9210: Joint Sealants.
4. Section 09 0175: Preparation of existing surfaces for painting and wall covering.

E. Definitions: "Paint," as used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Samples: Following the selection of colors and glosses by the Architect, submit Samples for the Architect's review.
a. Provide four Samples of each color and each gloss for each material on which the finish is specified to be applied, approximately 8" x 10" in size.
b. Provide wood stain samples on specified wood for color selection or approval.
c. If so directed by Architect, submit Samples during progress of the Work in the form of actual application of the approved materials on actual surfaces to be painted.
d. Revise and resubmit each Sample as requested until the required gloss, color, and texture are achieved. Such Samples, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.
e. Do not commence finish painting until approved Samples are on file at the job site.

B. Contract Closeout Submittals: Manufacturer's recommended cleaning procedures.

1.3 QUALITY ASSURANCE

A. Comply with applicable codes and regulations of governmental agencies having jurisdiction, including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this specification, comply with the more stringent provisions.

B. Paint Coordination:
1. Provide finish coats which are compatible with the prime coats actually used and specified.
2. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrata.
3. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
4. Provide barrier coats over noncompatible primers, or remove the primer and reprime as required.

5. Notify the Architect in writing of anticipated problems in using the specified coating systems over prime-coatings supplied under other Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. General:
1. Do not store flammable materials inside buildings.
2. Mix paint in a location and manner that will protect the environment and facilities.
3. Provide ventilation needed to comply with OSHA requirements.

1.5 SITE CONDITIONS

A. Do not apply exterior materials during fog, rain, or mist, or when inclement weather is expected within the dry time specified by the manufacturer. No exterior or interior painting shall be performed until the surfaces are thoroughly dry and cured. Do not apply paint when temperature is below 50̊F. Avoid painting surfaces when exposed to direct sunlight.

1.6 EXTRA MATERIALS

A. Upon completion of the work of this Section, deliver to the Owner an extra stock equaling 5% of each color, type, and gloss of paint used in the Work, tightly sealing each container, and clearly labeling with contents and location where used.

B. Deliver materials to the Inspector of Record along with an inventory list of items provided. Obtain and forward to the Architect, a signed receipt from the Inspector accepting delivery.

**PART 2 - PRODUCTS**

2.1 PAINT MATERIALS

A. Products specified are for establishing the type, design, and quality required and are based on products of **Sherwin-Williams.** Other product systems approved for use are by Pittsburg Paints**,** Dunn-Edwards, and Frazee. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.
1. Where products are proposed other than Sherwin-Williams, submit a new painting schedule compiled in the same format used for the Painting Schedule included in this Section.
2. Approved specifications of materials for the other referenced manufacturers may be obtained from the Architect.

B. Undercoats and Thinners:
1. Provide undercoat paint produced by the same manufacturer as the finish coat, unless specified otherwise.
2. Use only the thinners recommended by the paint manufacturer, and use only to the recommended limits.
3. Provide undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

C. Paint Systems: The specified standard is 100% acrylic premium top-of-the line paint, except where surfaces are specified to receive industrial coatings.

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2.2 COLOR SCHEDULES

A. Refer to the Finish Schedule on the Drawings.

2.3 APPLICATION EQUIPMENT

A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and in accordance with all current Environmental Protection Agency standards and regulations.

2.4 JOINT SEALANTS

A. Provide in accordance with Section 07 9200.

2.5 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 MATERIALS PREPARATION

A. Mix, prepare, and store painting and finishing materials in accordance with the manufacturer’s written recommendations.

3.3 SURFACE PREPARATION

A. General:
1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations.
2. Remove removable items which are in place and are not scheduled to receive paint finish.
3. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.
4. Clean each surface to be painted prior to applying paint or surface treatment.
5. Remove dirt and other foreign substances. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F, prior to start of mechanical cleaning.
6. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.

B. Metal:
1. Thoroughly clean surfaces until free from dirt, oil, and grease per SSPC-SP 1. Remove all mill scale, rust formation, etc.
2. On galvanized surfaces, use solvent for the initial cleaning, and then treat the surface thoroughly with etching solution. Remove etching solution completely before proceeding. **Prime etched metals the same day cleaning was performed.** If any oxidation (white rust) has formed, sand and remove all forms of

contamination. If the galvanized has been passivated or stabilized, the surface must be abraded, i.e. Brush-Off Blast Clean per SSPC-SP7 or chemically treated.
3. Allow to dry thoroughly before application of paint.
4. Primers specified for structural steel and metal fabrications are standalone systems. Apply full paint system as specified in this Section even if metal comes preprimed or shop primed.

C. Prefinished Metal:
1. Solvent clean per SSPC-SP 1. Abrade substrate to remove gloss and obtain minimum surface profile of 1.0 mil. Solvent wipe to remove dust.

D. Concrete:
1. Thoroughly clean surfaces.
2. Prior to painting, the material shall be dry to the extent that a proper, long lasting, and non-blistering bond will be assured. Should the dryness of the substrate be in question, test the substrate in the presence of the paint manufacturer's representative. Do not paint substrate in question until dryness condition improves to meet the paint manufacturer's requirements.

E. Masonry and Cement Plaster:
1. Allow to dry at least 30 days prior to cleaning in preparation for painting.
2. Remove glaze, efflorescence, laitance, surface deposits, and other foreign matter.

F. Gypsum Board: Remove all sanding dust.

G. Wood, Painted Finish:
1. Remove surface deposits of sap and pitch by scraping and cleaning with mineral spirits.
2. Seal all knots and pitch pockets with the paint manufacturer's recommended materials prior to prime coat.
3. Sand smooth all wood surfaces exposed to view, using the proper sandpaper and remove dust. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface.
4. After prime coat is dry, fill cracks, holes, and scratches with suitable wood filler or spackling compound. When dry, sand flush with surface.
5. Do not proceed with painting of wood surfaces until the moisture content of the wood is 12% or less as measured by a moisture meter.

H. Wood, Stained Finish:
1. Apply paste wood filler to open grained wood prior to sanding.
2. Sand smooth all wood surfaces exposed to view, using the proper sandpaper and remove dust. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface.
3. Apply wash coat of sealer, sand and remove dust.
4. Lightly sand and clean between finish coats as recommended by the paint manufacturer.
5. Seal tops, bottoms, and edges of cutouts on wood doors.

3.4 JOINT SEALANT

A. Refer to Section 07 9200.

B. Joint locations:
1. Intersection of interior painted wall / ceiling surface to door and window frames.
2. Intersection of exterior wall finish to door and window frames, color to match adjacent wall finish.
3. Intersection of painted wall / ceiling surface to dissimilar wall /ceiling surface (painted or unpainted).

3.5 PAINT APPLICATION

A. General:
   1. Touchup or reprime shop-applied prime coats which have been damaged, and touchup bare areas prior to start of finish coats application.
   2. Slightly vary the color of succeeding coats.
      a. Do not apply additional coats until the completed coat has been inspected and approved.
      b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
   3. Sand and dust between coats to remove defects visible to the unaided eye from a distance of five feet.
   4. On removable panels and hinged panels, paint the back sides to match the exposed sides.
   5. Finish to be smooth.

B. Priming: Primers specified for structural steel and metal fabrications are standalone systems. Apply full paint system as specified in this Section even if metal comes preprimed or shop primed.

C. Drying: Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.

D. Brush Applications:
   1. Brush out and work the brush coats onto the surface in an even film.
   2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
   3. Ferrous and non-ferrous metals may be sprayed on first coat(s) but final coat shall be applied with brush or roller.

E. Spray Application:
   1. Except as specifically otherwise approved by the Architect, confine spray application to wall surfaces, large expanse areas and similar surfaces where hand brush work would be inferior.
   2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
   3. Do not double back with spray equipment to build up film thickness of two coats in one pass.
   4. Ferrous and non-ferrous metals may be sprayed on first coat(s) but final coat shall be applied with brush or roller.

F. Roller Application:
   1. Apply paint with short nap roller on all metal doors. Color as specified (same interior and exterior).
   2. Remove all surface applied door trim prior to painting.
   3. Roller marks, lap marks, runs, sags, fuzz, lint or other surface imperfections will not be acceptable.
   4. Ferrous and non-ferrous metals may be sprayed on first coat(s) but final coat shall be applied with brush or roller.

G. For completed work, match the approved Samples as to texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

H. Exposed Mechanical and Electrical Items:
   1. Finish electric panels, access doors, conduits, pipes, ducts, grilles, registers, vents, exposed plumbing vents and flues, and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.
   2. Paint visible duct surfaces behind vents, registers, and grilles flat black.
   3. Exposed vents and flues: Apply two coats of heat-resistant paint approved by the Architect.
   4. Factory finished items that match color scheme may be approved for leaving unpainted by Architect.

I. Exposed Pipe and Duct Insulation:
   1. Apply one coat of latex paint on insulation which has been sized or primed under other Sections; apply

two coats on such surfaces when unprepared.
2. Match color of adjacent surfaces unless otherwise noted.
3. Remove band before painting, and replace after painting.

J. Hardware: Paint prime coated hardware to match adjacent surfaces, unless otherwise noted. Paint metal portions of head seals, jamb seals, and astragal seals to match the color of the door frame unless otherwise directed by the Architect.

K. Wet Areas:
1. In toilet rooms and contiguous areas, add an approved fungicide to paints.
2. For oil base paints, use 1% phenolmercuric or 4% tetrachlorophenol.
3. For water emulsion and glue size surfaces, use 4% sodium tetrachlorophenate.

L Miscellaneous:
1. Use "stipple" finish where enamel is specified.
2. Ferrous Metal: When metal comes shop primed or preprimed, always reprime with a solvent primer or Direct-to-Metal (DTM) primer. Sand or remove all visible rust.
3. **Wood Trim: Backprime exterior wood trim prior to installation with the paint manufacturer's recommended exterior wood primer.**
4. Touch-up shall be performed using the same application method as the original final coat application.

3.6 PROTECTION

A. Protect floors, furnishings, equipment, finish hardware, name or information plates, dials, gauges, tile, or other such surfaces not requiring painting from spotting, spillage, or damage of any kind. Clean, repair, or replace any damaged surfaces as directed by the Architect.

B. Remove, loosen, or mask hardware, fixture canopies, outlet covers, switch plates, and other similar items as required for painting work and then replace.

C. Using workmen skilled in these trades, move equipment adjacent to walls to permit wall surfaces to be painted, and following completion of painting, replace and reconnect.

3.7 CLEANING

A. Upon completion of all paint work, clean paint from all glass surfaces leaving a sharp clean line.

B. Remove paint spots, oil, or stains.

3.8 PAINTING SCHEDULE

A. General: Provide paint systems as specified below.
1. Products specified in this schedule are based upon products of **Sherwin-Williams** and are specified for establishing the type and quality of products required. Refer to Paragraph 2.1.A of this Section.
2. See Finish Schedule for colors and gloss.
3. Abbreviations: (F) = Flat, (LL) = Low Luster, (SGE) = Semi-Gloss Enamel; (ESE) = Eggshell Enamel; (GE) = Gloss Enamel; (SL) = Stain/Lacquer

B. Exterior Metal, Ferrous (SGE):
1. First coat: B66-310, Pro Cryl Universal Primer
2. Second coat: B66 Series DTM Semi-Gloss
3. Third coat: B66 Series DTM Semi-Gloss

C. Exterior Metal, Galvanized and Aluminum (SGE):
   1. First coat: B71Y1, DTM Wash Primer
   2. Second coat: B66 Series, DTM Semi-Gloss
   3. Third coat: B66 Series, DTM Semi-Gloss

D. Exterior Metal, Prefinished Aluminum (SGE):
   1. First coat: B5100150, Extreme Bonding Primer
   2. Second coat: B66 Series, DTM Semi-Gloss
   3. Third coat: B66 Series, DTM Semi-Gloss

E. Exterior Metal, Prefinished Ferrous (SGE):
   1. First coat: B5100150, Extreme Bonding Primer
   2. Second coat: B66-350, Sher-Cryl HPA Semi-Gloss
   3. Third coat: B66-350, Sher-Cryl HPA Semi-Gloss

F. Exterior Cement Plaster and Concrete (LL):
   1. First coat: A24W300, Loxon Masonry Primer
   2. Second coat: A6 Series, A100 Exterior Flat
   3. Third coat: A6 Series, A100 Exterior Flat

G. Exterior Concrete Block (F):
   1. First coat: B42W46, Heavy Duty Block Filler
   2. Second Coat: A6 Series, A100 Exterior Flat
   3. Third coat: A6 Series, A100 Exterior Flat

H. Exterior Wood (F):
   1. First coat: B42W41, A100 Exterior Latex Wood Primer
   2. Second coat: A6 Series, A100 Exterior Flat
   3. Third coat: A6 Series, A100 Exterior Flat

I. Exterior Wood - Solid Color Stain (F):
   1. First coat: A15 Series, Woodscapes Exterior Acrylic Solid Color Stain
   2. Second coat: A15 Series, Woodscapes Exterior Acrylic Solid Color Stain

J. Interior Primer Only behind FRP or VWC:
   1. Gypsum Drywall: B28W200, Prep Rite 200 Latex Primer
   2. Concrete Block: B42W46, Heavy Duty Block Filler

K. Interior Flat Wall Paint (F):
   1. Gypsum Drywall:
      a. First coat: B28-2600, Pro Mar 200 Zero Primer
      b. Second coat: B30-3600, Pro Mar 200 Zero Flat
      c. Third coat: B30-3600, Pro Mar 200 Zero Flat
   2. Concrete Block:
      a. First coat: B42W46, Heavy Duty Block Filler
      b. Second coat: B30-3600, Pro Mar 200 Zero Flat
      c. Third coat: B30-3600, Pro Mar 200 Zero Flat
   3. Acoustic Surfaces:
      a. First Coat: B30WJ6851 Showcase Plus
      b. Second Coat: B30WJ6851 Showcase Plus

L. Interior Egg-Shell Enamel (ESE):
   1. Gypsum Drywall:

a. First coat: B28-2600, Pro Mar 200 Zero Primer
b. Second coat: B20-2600, Pro Mar 200 Zero EG
c. Third coat: B20-2600, Pro Mar 200 Zero EG

2. Concrete Block:
   a. First coat: B42W46, Heavy Duty Block Filler
   b. Second coat: B20-2600, Pro Mar 200 Zero EG
   c. Third coat: B20-2600, Pro Mar 200 Zero EG
3. Cement Plaster:
   a. First coat: A24, Loxon Masonry Primer
   b. Second coat: B20-2600, Pro Mar 200 Zero EG
   c. Third coat: B20-2600, Pro Mar 200 Zero EG
4. Ferrous Metal:
   a. First coat: B66-310, Pro Cryl Universal Primer
   b. Second coat: B20-2600, Pro Mar 200 Zero EG
   c. Third coat: B20-2600, Pro Mar 200 Zero EG
5. Galvanized Metal:
   a. First coat: B71Y1, DTM Wash Primer
   b. Second coat: B20-2600, Pro Mar 200 Zero EG
   c. Third coat: B20-2600, Pro Mar 200 Zero EG

M. Interior Semi-Gloss Enamel (SGE):
1. Ferrous Metal:
   a. First coat: B66-310, Pro Cryl Universal Primer
   b. Second coat: B6601551, Multi-Surface Acrylic
   c. Third coat: B6601551, Multi-Surface Acrylic
   d. Note: Where trim paint is an extension of or same as exterior color, use the same paint specified under “Exterior Metals”.
2. Galvanized Metal:
   a. First coat: B71Y1, DTM Wash Primer
   b. Second coat: B6601551, Multi-Surface Acrylic
   c. Third coat: B6601551, Multi-Surface Acrylic
   d. Note: Where trim paint is an extension of or same as exterior color, use the same paint specified under “Exterior Metals”.
3. Wood Doors and Trim:
   a. First coat: B5100150, Extreme Bonding Primer
   b. Second coat: B6601551, Multi-Surface Acrylic
   c. Third coat: B6601551, Multi-Surface Acrylic
4. Prefinished Aluminum:
   a. First coat: B5100150, Extreme Bonding Primer
   b. Second coat: B6601551, Multi-Surface Acrylic
   c. Third coat: B6601551, Multi-Surface Acrylic
5. Concrete Block:
   a. First coat: B42W46, Heavy Duty Block Filler
   b. Second coat: B31-2600, Pro Mar 200 Zero SG
   c. Third coat: B31-2600, Pro Mar 200 Zero SG
6. Gypsum Drywall:
   a. First coat: B28-2600, Pro Mar 200 Zero Primer
   b. Second coat: B31-2600, Pro Mar 200 Zero SG
   c. Third coat: B31-2600, Pro Mar 200 Zero SG

N. Interior Gloss Enamel (GE):
1. Ferrous Metal:
   a. First coat: B66-310, Pro Cryl Universal Primer

b. Second coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
c. Third coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel

2. Galvanized Metal:
   a. First coat: B71Y1, DTM Wash Primer
   b. Second coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
   c. Third coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
   d. Note: Where trim paint is an extension of or same as exterior color, use the same paint specified under “Exterior Metals”.
3. Wood Doors and Trim:
   a. First coat: B5100150, Extreme Bonding Primer
   b. Second coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
   c. Third coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
4. Concrete Block:
   a. First coat: B42W46, Heavy Duty Block Filler
   b. Second coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
   c. Third coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
5. Gypsum Drywall:
   a. First coat: B5100150, Extreme Bonding Primer
   b. Second coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel
   c. Third coat: B21W351, Pro Classic Waterborne Interior Gloss Enamel

O. Stain and Lacquer (SL):
1. Wood Doors and Trim (transparent):
   a. Stain: A49 Series, Wood Classics Oil Stain
   b. First coat: B44MJ91, Lacquer Sealer
   c. Second coat: B44FJ86, Semi-Gloss Lacquer
   d. Third coat: B44FJ86, Semi-Gloss Lacquer
2. Wood Trim (opaque):
   a. First coat: A15 Series, Woodscapes Acrylic Solid Color Stain
   b. Second coat: A15 Series, Woodscapes Acrylic Solid Color Stain

P. Acoustic Surfaces:
1. First coat: B30WJ6851, Showcase Plus Interior Flat
2. Second coat: B30WJ6851, Showcase Plus Interior Flat

Q. Exposed (Sealed) Concrete Floors:
1. General Polymers clear floor coating and resinous flooring.
2. Epoxy Flooring: SW Armorseal 8100.

**END OF SECTION 09 9100**

# SECTION 10 1115 - MARKER BOARDS

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Provide markerboards where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

### 1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturer's recommended installation procedures.

B. Contract Closeout Submittals: Manufacturer's recommended cleaning procedures.

## PART 2 - PRODUCTS

### 2.1 MARKER BOARDS

A. Liquid marker boards, porcelain enamel-coated 24 gage steel writing surface on 1/2" industrial grade particle board with moisture retardant barrier back sheet.
   1. Clear anodized aluminum trim with wrapped and mitered corners.
   2. Box style marker trough with end caps, 2" high map rail with black cork insert, map hooks (1 for every 2 linear feet), and one flag standard per room.
   3. Size: As indicated on Drawings and **continuous up to 16' wide without joints**.
   4. Low gloss, glare free, multi-media writing and projection surface.

B. Acceptable Products:
   1. Series 10-150 by Aarco Products Inc., (800) 246-6038.
   2. 202 Series by MooreCo, Inc., (800) 749-2258.
   3. Series 4 by Claridge Products and Equipment, Inc., (800) 434-4610.
   4. BTS Series by Platinum Visual Systems, (800) 498-2990.
   5. Series A-B1 by ADP Lemco, Inc., (800) 575-3626.
   6. Series 2000, By Nelson Adams (NACO) 909-879-0421.

### 2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. Provide one box of 12 assorted colored markers for each markerboard, and one eraser set for each 12 foot length of markerboard or portion thereof.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use.

**END OF SECTION 10 1115**

**SECTION 10 1400 - SIGNAGE**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide identifying devices where shown on the Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:
   1. Restroom signage.
   2. Room identification signage (room name, room number).
   3. Tactile exit signage.
   4. Accessibility signage.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
   2. Installation Procedures: Submit manufacturer's recommended installation procedures.
   3. Shop Drawings: Submit shop drawings showing details of installation and anchorage sufficient to enable proper interface with the work of other trades.
   4. Samples:
      a. Provide color chip samples to match colors specified.
      b. Provide sample of sign for example of quality and design characteristics.

1.3 QUALITY CONTROL

A. Code References:
   1. Raised Characters: 11B-703.2.
   2. Braille: Section 11B-703.3.
   3. Visual Characters: Section 11B-703.5.
   4. Pictograms: Section 11B-703.6.
   5. Symbols of Accessibility: Section 11B-703.7.
   6. International Symbol of Accessibility: Section 11B-703.7.2.1.

**PART 2 - PRODUCTS**

2.1 APPROVED MANUFACTURERS

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Acceptable Products: Design of plexiglass signs is based on the use of manufacturer’s standard products: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
   1. ASI Sign Systems.
   2. Inland Pacific.
   3. Innerface Architectural Signage, Inc.
   4. Mohawk Sign Systems.
   5. Vomar Products, Inc.

6. Best Signs, Inc.

2.2 SIGNS

A. **Type "A" - Restroom Signs**:
1. Type A1: MEN - 12" equilateral triangle.
2. Type A2: WOMEN - 12" diameter circle.
3. Type A3: UNISEX - 12" diameter circle with equilateral triangle inscribed. Triangle color shall contrast with circle color. Circle color shall contrast with door color.
4. Type A4: Restroom, with raised wheelchair logo, 3/4" high raised text and braille.
   a. Braille: Contracted (Grade 2) braille symbols on sign A4 per CBC Section 11B-703.3.
5. Material:
   a. Types A1, A2, and A3: 1/4" thick acrylic plastic, 1/4" radius corners.
   b. Type A4: 1/8" acrylic plastic base plaque, integral color (single piece, not laminated), 1/4" radius corners, 1/32" raised letters and numbers.
6. Color: Black with white silk screened lettering and graphic, see detail.
7. Attachment: Epoxy and vandal resistant screws.
8. Text: See graphics/text detail on the drawings.
9. Letter Style: Calibri, all capital letters.

B. **Type "B" - Room Name, Room Number, or Tactile Exit Signs:**
1. Type B1: 4"H x Length as Required (LAR).
2. Type B2: 4"H x LAR.
3. Type B3: 5-1/2"H x LAR.
4. Type B4: 4"H x LAR, text: “EXIT”
5. Material: 1/8" acrylic plastic base plaque, integral color (single piece, not laminated), 1/4" radius corners, 1/32" raised letters and numbers.
6. Color: Black with white lettering.
7. Attachment:
   a. Exterior: Epoxy and minimum of 2 vandal resistant screws
   b. Interior: Epoxy
8. Letter style: Calibri, all capital letters.
9. Text: Refer to the Door Schedule and related details on the Drawings.
10. Numeral height: 2".
11. Letter height: 1". Except at access doors for automatic sprinkler riser rooms and fire pump rooms which require 2” minimum height with a minimum stroke of 3/8”.
12. Braille: Contracted (Grade 2) braille symbols on all room name and number signs per Section 11B-703.3.

C. **Type "F" - Listening Assistance Sign:**
1. Size: 10" x 8".
2. Material: 1/8" acrylic plastic base plaque, integral color (single piece, not laminated), 1/4" radius corners, 1/32" raised letters and numbers.
3. Color: International Blue with white symbols and text.
4. Attachment: Double stick tape four edges with 4 vandal resistant screws.
5. Letter style: Calibri, all capital letters.
6. Letter height: 5/8".
7. Text: As indicated on the Drawings.

2.3 BRAILLE REQUIREMENTS

A. Braille Symbols:
1. Contracted (Grade 2) braille.
2. Braille Dots:

a. Base diameter: 0.059” to 0.063”.
b. Distance between two dots in the same cell: 0.100”.
c. Distance between corresponding dots in adjacent cells: 0.300”.
d. Raise dots 0.025” to 0.037” above the background.
e. Distance between corresponding dots from one cell directly below: 0.395” to 0.400”.
f. Dots shall have domed or rounded tops.

2.4 TACTILE CHARACTER REQUIREMENTS

A. Raised Character Proportions per CBC Section 11B-703.2.4 and 11B-703.2.6:
1. Width of upper-case letter "O" shall be a minimum of 60% and a maximum of 110% of the height of the upper-case letter "I".
2. Stroke thickness of upper-case letter "I" shall be 15% maximum of the height of the character.

B. Visual Character Proportions per CBC Section 11B-703.5.4 and 11B-703.5.7:
1. Width of upper-case letter "O" shall be a minimum of 60% and a maximum of 110% of the height of the upper-case letter "I".
2. Stroke thickness of upper-case letter "I" shall be a minimum of 10% and a maximum of 20% maximum of the height of the character.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the manufacturers' recommendations as approved by the Architect, using only the approved mounting materials, and locating all components firmly into position, level and plumb.

B. Mounting Location and Height. Install signs on the nearest wall adjacent to the latch side of the door. Where there is no wall or space on the latch side, including at double doors, place signs on the nearest adjacent wall, preferably on the right.
1. Mount signs 48" minimum above the finish floor or ground surface, measured from the baseline of the lowest line of Braille and 60" maximum above the finish floor or ground surface measured from the baseline of the highest line of raised characters.
2. Determine mounting location such that a person may approach within 3" of signage without encountering protruding objects or standing within the swing of the door.

C. At locations where an exit sign and a room identification sign are back to back on glass, align both signs and make signs the same size.

D. At locations where a sign is mounted on glass with no opposing sign, provide blank sign of the same size to conceal mounting adhesive.

E. Where signs are mounted on split-faced masonry, grind masonry to provide smooth surface to mount signs.

**END OF SECTION 10 1400**

## SECTION 10 2120 - PHENOLIC TOILET PARTITIONS

### PART 1 - GENERAL

1.1 SUMMARY

A. Provide: Floor and ceiling anchored, overhead braced, phenolic toilet partitions system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. Grab bars provided by Toilet Accessories.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 10 2810: Toilet Accessories

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Shop Drawings: Submit shop drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with adjacent trades.
4. Color Charts: Submit 4 color charts or samples showing colors selected by the Architect.

B. Contract Closeout Submittals: Manufacturer's recommended cleaning procedures.

1.3 FIRE TESTING REQUIREMENTS

A. Flame Spread Characteristics: Provide materials bearing UL label and marking indicating fire hazard classification of wall covering as determined by ASTM E84. Provide materials with the following flame spread ratings:
1. Class B; 75 or less, smoke generation less than 450.

B. Corner Test for Interior Partitions: Comply with NFPA286.
1. Smoke Developed Index: smoke released throughout NFPA 286 shall not exceed 1,000 M2.
2. Flame Spread Index: Flame shall not spread to ceiling, and shall not to the outer extremity of sample test on any wall.
3. The peak rate of heat released throughout the NFPA286 test shall not exceed 800 kw.

1.4 QUALITY ASSURANCE

A. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturers specified in the Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer’s Standard Colors and Finishes: Where the Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.

3. Custom Colors: Where the Finish Schedule indicates a specific manufacturer's colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

1.4 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, submit 2 original copies of the manufacturer's written **10-year warranty** for delamination, corrosion, or breakage.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Acceptable Manufacturers:
1. Duraline Series (institutional grade) 1082 (toilet) and 1083 (urinal screen) by BOBRICK.
2. Pro-Nolic by PSiSC.
3. Accurate Partitions Corp.
4. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Provide: Floor anchored, overhead braced, phenolic toilet partitions and urinal screens as indicated on the Drawings, in the dimensions and arrangements shown, and with the following attributes.
1. Door panels, partitions, and pilasters: Not less than 3/4" thick solid phenolic panel.
a. Provide 36" wide clear door opening at disabled accessible stall.
2. Finish:
a. Solid phenolic core with multiple resin-impregnated kraft, color and clear Melamine surface sheets fused at high temperature and pressure with polished black phenolic edges.
b. Colors indicated on the Finish Schedule.
3. Wall and Pilaster Brackets: Continuous "U-channel", 18 gage full height Type 304 stainless steel at pilaster and wall attachments.
4. Bracket Fasteners:
a. Continuous Wall bracket at masonry: #14 x 2-1/2" long Stainless Steel phillips pan head screws and plastic #14 anchors at 9" on center vertical spacing
b. Continuous Wall bracket at wood: #14 x 2-1/2" long Stainless Steel phillips pan head screws at 12" on center vertical spacing into solid wood blocking.
5. Base anchor: (2) 3/8" threaded rod floor anchors with stainless steel shoe.
6. Threaded Inserts: Concealed threaded inserts for institutional hardware.

C. Hardware:
1. Latching: 14 gage sliding door latch, 11 gage keeper; latch slides on a shock-resistant nylon track. Twist-style door latch operation not acceptable.
2. Hinges: 16 gage stainless steel, self-closing, continuous piano hinge.
3. Mounting Brackets: 18 gage stainless steel and extend full height of panel.
4. Fasteners: Stainless steel bolts, screws, nuts and expansion anchors. Provide one-way, vandal resistant anchors at exposed locations.

D. Compartments:
1. Standard Compartment:
a. Coat hook/bumper mounted at +48".
b. Bright anodized heavy-duty extruded aluminum door latch housing with slide bolt and button.
2. Accessible Compartment:
a. Coat hook/bumper mounted at +48".

b. Bright anodized heavy-duty extruded aluminum door latch housing with slide bolt and button.
c. Wall stop.
d. U-shaped or loop handle on each side of the door, immediately below latch.

E. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use, plumb, level, and square.

C. Except for compartments for the handicapped, adjust doors to remain at a uniformly open position when unlocked.

D. Touchup scratches and abrasions to be permanently and completely invisible to the unaided eye from a distance of five feet.

**END OF SECTION 10 2120**

## SECTION 10 2610 - WALL AND CORNER PROTECTION

### PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Protective wall covering.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.

1.3 QUALITY ASSURANCE

A. Colors: Provide finish selections indicated in the Finish Schedule.
1. Acceptable Manufacturers: The products and manufacturer’s specified in Finish Schedule are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Section 01 2500 for substitution requirements.
2. Manufacturer’s Standard Colors and Finishes: Where Finish Schedule specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated on the Drawings.
3. Custom Colors: Where Finish Schedule indicates a specific manufacturer’s colors, other acceptable manufacturers shall provide matching custom colors where a standard color is not acceptable.

### PART 2 - PRODUCTS

2.1 PROTECTIVE WALL COVERING

A. Acceptable Products:
1. 0.040" Protective Wall Covering by Korogard.
2. 0.040" WC-40 by Pawling Corp.
3. 0.040" Acrovyn VA-200 by Construction Specialties Inc.
4. 0.040" Rigid Vinyl Sheet by Institutional Products Corp.
5. 0.040” Palladium Rigid Vinyl Sheet by InPro Corp.

B. Provide continuous sections to maximum length possible or as shown on Drawings.

C. Provide manufacturer's standard trim products as needed for joints and transitions.

D. Colors and Textures: As selected by the Architect from the manufacturer's standard colors and textures.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the approved Shop Drawings and the recommendations of the manufacturers as approved by the Architect, anchoring all components firmly into position in true alignment within a tolerance of one in 1000 vertically and horizontally.

C. Provide continuous pieces in the maximum length possible. Pieces shorter than 3'-0" shall not be used.

D. Provide tight fitting flush joints between pieces.

**END OF SECTION 10 2610**

**SECTION 10 2810 - TOILET ACCESSORIES**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide toilet accessories where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Shop Drawings: Submit dimensioned drawings as required to depict the space required for these items, and their interface with the work of other trades.

B. Contract Closeout Submittals: Operation and Maintenance manuals in accordance with requirements of Section 01 7820.

**PART 2 - PRODUCTS**

2.1 TOILET ACCESSORIES

A. Basis of Design: Bobrick Contura Series.
1. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

B. Provide all listed products by one manufacturer:

**GB-1:** Grab Bar constructed of 18 gauge type 304 satin-finish stainless steel, horizontal 2-wall type, concealed mounting, stainless steel, 1-1/2" outside diameter; Bobrick B-6897 .

**GB-2:** Grab Bar constructed of 18 gauge type 304 satin-finish stainless steel, concealed mounting, stainless steel, 1-1/2" outside diameter; Bobrick B-6806-48’’. Length as noted on plan.

**GM-1:** Tempered Glass Mirror; satin finish stainless steel angle frame with corners mitered, ground, and polished smooth; No. 1 quality, 1/4" thick tempered select float glass selected for silvering and electrolytically copper plated by the galvanic process; concealed theft resistant mounting. Bobrick B-2908. Sizes as indicated.

**HD-1:** Dyson Airblade V, HU02, 110-120V, 9.09A, surface mounted, color white.

**PT-1:** Paper towel dispenser, surface mounted; Optima Allied West # OPT-89420.
Allied West Paper auto-cut mechanical hands free roll towel dispenser in black with double latch lock.

**PT-2:** Paper towel dispenser, with Towelmate surface mounted satin-finish stainless steel; tumbler lock on top of cabinet radius contoured front door, with one piece drawn cover; Bobrick B-262.

**SD-1:** Foam Soap Dispenser surface mounted; DRACO # 1570-1, compatible with Bag-Foam replacement cartridges.

**TP-1:** Toilet Paper Dispenser surfaced mounted multi-roll dispenser; with contoured front, with one piece drawn cover and theft resistant heavy duty spindles; Bobrick B-4288.

**TP-2:** Toilet Paper Dispenser surfaced mounted single-roll dispenser; color smoke; TORK Model 66TR.

**TSC-1:** Toilet Seat Cover Dispenser; satin stainless steel contoured front, beveled flanges, no exposed corners or edges; Bobrick B-4221.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. All fixtures shall be provided with vandal-resistant screws and attachments.

C. General Contractor shall provide solid wood, metal or masonry backing as required for all wall-mounted fixtures.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install each item in its proper location, firmly anchored into position, level and plumb, and in accordance with the manufacturer's recommendations.

**END OF SECTION 10 2810**

## SECTION 10 4400 - FIRE PROTECTION SPECIALTIES

### PART 1 - GENERAL

1.1 SUMMARY

A. Provide fire protection specialties where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Shop Drawings: Submit shop drawings as needed to depict the space required for these items, and their interface with the work of other trades.

B. Contract Closeout Submittals: Manufacturer's recommended operating instructions in accordance with requirements of Section 01 7820.

1.3 DEFINITIONS

A. Light (Low) Hazard Location: Locations where total amounts of Class A combustible materials is of minor quantity, including offices, classrooms, and assembly halls.

B. Extra (High) Hazard Location: Locations where the total amounts of Class A combustibles or Class B flammable are present in storage, production, or use, and/or finished product over and above those expected and classed as Ordinary (Moderate) Hazards, including laboratories, woodworking and vehicle repair.

### PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 SURFACE MOUNTED FIRE EXTINGUISHER BRACKETS

A. J.L. Industries No. MB810 or MB818.

2.3 FIRE EXTINGUISHER CABINETS AT LIGHT (LOW) HAZARD LOCATIONS

A. Semi-recessed Cabinets at 2 X 4 Walls: J.L. Industries Cosmopolitan 8137W17, 2-1/2" projection, stainless steel, #4 satin finish, rolled edge construction with corners welded and ground smooth.

B. Recessed Cabinets at 2 X 6 (and larger) Walls: J.L. Industries Cosmopolitan 8135W17, 3/8" projection, stainless

steel with #4 satin finish, flat trim construction with corners welded and ground smooth.

C. Where cabinets occur in fire-rated construction, provide J.L. Industries FIRE-FX option; ASTM E814, labeled for 1-hour combustible and 2-hour non-combustible construction. WHI- TEST# 631-021201 / 631-021202

2.4 FIRE EXTINGUISHER CABINETS AT EXTRA (HIGH) HAZARD LOCATIONS

A. Semi-recessed Cabinets at 2 X 4 Walls: J.L. Industries Cosmopolitan 1037W17, 3" projection, stainless steel, #4 satin finish, rolled edge construction with corners welded and ground smooth.

B. Recessed Cabinets at 2 X 6 (and larger) Walls: J.L. Industries Cosmopolitan 1035W17, 3/8" projection, stainless steel with #4 satin finish, flat trim construction with corners welded and ground smooth.

C. Where cabinets occur in fire-rated construction, provide J.L. Industries FIRE-FX option; ASTM E814, labeled for 1-hour combustible and 2-hour non-combustible construction. WHI- TEST# 631-021201 / 631-021202.

2.5 FIRE EXTINGUISHER CABINETS AT KITCHEN K-RATED EXTINGUISHERS

A. Semi-recessed Cabinets at 2x4 Walls: J.L. Industries Cosmopolitan 2032W17, 4" projection, stainless steel with #4 satin finish, rolled edge construction with corners welded and ground smooth.

B. Recessed Cabinets at 2x6 (and larger) Walls: J.L. Industries Cosmopolitan 2037W17, 2-1/2" projection, flat trim construction with corners welded and ground smooth, stainless steel with #4 satin finish.

C. Where cabinets occur in fire-rated construction, provide J.L. Industries FIRE-FX option; ASTM E814, labeled for 1-hour combustible and 2-hour non-combustible construction. WHI- TEST# 631-021201 / 631-021202

2.6 COMBINATION FIRE EXTINGUISHER / FIRE HOSE CABINETS

A. Semi-recessed Cabinets at 2 X 4 Walls and 2x6 Fire Rated Walls: J.L. Industries Crownline 6237W17-1403, 2-1/2" projection, stainless steel, #4 satin finish, rolled edge construction with corners welded and ground smooth.

B. Recessed Cabinets at 2 X 6 (and larger) Walls: J.L. Industries Crownline 6235W17-1403, 3/8" projection, stainless steel with #4 satin finish, flat trim construction with corners welded and ground smooth.

C. Where cabinets occur in fire-rated construction, provide J.L. Industries FIRE-FX option; ASTM E814, labeled for 1-hour combustible and 2-hour non-combustible construction. WHI- TEST# 631-021201 / 631-021202

D. Fire Hose and Rack Assembly: J.L. Industries HRA100B Fire Hose and Rack Assembly, 1-1/2" hose and valve.
   1. Hose: FM-approved 500 lb test, single jacket polyurethane-lined hose, 100' length.
   2. Fog Nozzle: UL-rated industrial fog nozzle.
   3. Valve and Rack: Cast brass coupling angle valve, escutcheon and nipple; red enamel pin rack; UL-rated.
   4. 100 gpm at 65 psi at nozzle.
   5. Class II service.

2.7 FIRE EXTINGUISHERS

A. Light (Low) Hazard Locations: Provide one multi-purpose, dry chemical, 5 lb. fire extinguisher, **UL rating of 3A-40BC** at each cabinet.
   1. Heavy duty steel cylinder, metal valve and siphon tube, replaceable molded valve stem seal, corrosion and impact resistant epoxy finish, visual pressure gauge, pull pin, upright grip operation.
   2. JL Industries, Cosmic 5E or approved equal.

B. Extra (High) Hazard Locations: Provide one multi-purpose, dry chemical, 10 lb. fire extinguisher, **UL rating of 4A-80BC** at each cabinet.
   1. Heavy duty steel cylinder, metal valve and siphon tube, replaceable molded valve stem seal, corrosion and impact resistant epoxy finish, visual pressure gauge, pull pin, upright grip operation.
   2. JL Industries, Cosmic 10E or approved equal.

C. Kitchens: Wet chemical fire extinguisher, 6 liter fire extinguisher, **UL rating of "K"**.
   1. Heavy duty stainless steel cylinder construction, metal valve and siphon tube, corrosion and impact resistant epoxy finish.
   2. Visual pressure gauge, pull pin, upright grip operation.
   3. Protective nozzle tip orifice seal, industry standard discharge horn and nozzle design.
   4. Nameplate showing only class "K" symbol, non-metallic nozzle tip finger guard.
   5. Installed fire extinguisher shall be within 30'-0" of the kitchen hood system.
   6. JL Industries, Saturn 15 or approved equal.

D. Service, charge, and tag each fire extinguisher not more than five calendar days prior to the Date of Substantial Completion of the Work as that Date is established by the Owner.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Owner, anchoring all components firmly into position for long life under hard use.

C. Locate bracket-mounted extinguishers where directed by the Owner and the Fire Department official.

**END OF SECTION 10 4400**

**SECTION 22 0000 - PLUMBING**

**PART 1: - GENERAL**

1.1 GENERAL MECHANICAL PROVISIONS:

A. The General Mechanical Provisions, Section 23 0000, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

A. Included: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Sanitary sewer system.
2. Domestic water system.
3. Drain system (including condensate drain).
4. All fixtures as shown or noted on the drawings or as specified.
5. Demolition as indicated on drawings. Where demolition is called for, remove all equipment, piping, braces, housekeeping pads, supports and related items no longer required.
6. Lead Free: All equipment, fixtures, valves and fixture stops providing water for human consumption installed after January 1, 2010, must meet the “Lead Free” requirements for the State of California.

B. Work Specified Elsewhere:
1. Line voltage power wiring, disconnect switches and installation of all starters are included in the Electrical Section unless otherwise noted.
2. Concrete and reinforcing steel unless specifically called for on the drawings or specifications.
3. Painting unless specifically called for in the drawings or specifications.
4. Carpentry.

**PART 2: - PRODUCTS**

2.1 PIPING MATERIALS:

A. Sanitary Sewer:
1. Soil, Waste and Vent Piping (Non-Pressurized):
a. Inside Building and Within 5 Feet of Building Walls: Standard weight coated cast iron pipe and fittings. Plain end, CISPI 301, ASTM A888, or hub end with rubber gaskets, ASTM A74, ASTM C564. ABI, Tyler, Charlotte. Couplings shall be heavy-duty shielded couplings, Type 304 stainless steel, with neoprene gasket, ASTM C-1540. Husky HD 2000, Clamp-All 80, Mission HeavyWeight. MG Couplings are also acceptable. 2" and smaller exposed to view shall be galvanized steel, ASTM A53, with coated cast iron recessed drainage fittings, ANSI B16.12. **Below grade cast iron pipe and fittings shall have 8 mil (minimum) Polyethylene Encasement (Poly Wrap), Per ANSI/AWWA C105/A21.5.**
2. Cleanouts: Comparable models of Josam, Wade, Mifab or Zurn are acceptable. Grease plug prior to installation. Floor Cleanouts: Smith 4023 with nickel bronze top in finished areas; Smith 4223 in utility areas. Wall Cleanouts: Smith 4532 with stainless steel cover and screw. Pipe Cleanouts: Iron body with threaded brass plug. Site cleanouts more than 5’ outside building may be PVC with PVC plug.
3. Cleanout Box: Precast reinforced concrete. Cast iron lid marked for service. Christy F8 in foot traffic areas; G5 in roadways. Provide with PVC pipe extension down to top of pipe.

B. Water:

1. Cold Water Piping: Materials used in the water system, except valves and similar devices, shall be of like material, except where otherwise approved by Engineer and Authority Having Jurisdiction, prior to start of work.
   a. Inside Building, Within Five Feet of Building Walls, and All Above Grade:
      (1) Hard temper seamless copper, ASTM B88. Wrought copper fittings, ANSI B16.22. Type L with brazed joints (1100F, min.). 1-1/2" and smaller above grade may be soldered, lead-free silver solder. Branch piping from the cold water main above the ceiling to roof mounted hose bibbs shall be type “K” copper. All nipples shall be lead-free red brass (85% copper). Above grade fittings may be copper (1/2” to 2”) or bronze (2-1/2” to 4”) press fittings, ASME B16.18 or ASME B16.22. EPDM O-rings. Installation shall be in accordance with the manufacturer’s installation instructions. ProPress, Apollo, Mueller Streamline.
   b. Outside Building - Below Grade:
      (1) Same as Inside Building. Galvanized steel shall have protective coating.

   -or-
      (2) 3" and Smaller: Schedule 80 Polyvinyl chloride (PVC), ASTM D1785, with Schedule 80 PVC solvent weld fittings, ASTM D2467 where approved by administrative authority.

   -or-
      (3) 4" and Larger: Polyvinyl chloride, AWWA C900, DR18, ASTM D1784, ASTM D2241, where approved by administrative authority, cast or ductile iron fittings, AWWA C110 or C153, Class 150, with rubber ring joints, ASTM D1869.
2. Valves and Specialties:
   a. Valves:
      (1) General: Manufacturer's model numbers are listed to complete description. Equivalent models of Crane, Kitz, Milwaukee, Nibco, Stockham, Walworth or Watts are acceptable. All valves of a particular type or for a particular service shall be by the same manufacturer. Provide a minimum of two operating "T" handles for underground valves for each underground system where valves are required. The lengths of the handles are dependent upon the depth of the valves and the ability of the handles to fully open and/or close the valves. At least one “T” handle for each system shall be on site at the beginning of the installation of a particular system for emergencies, and the Construction Manager shall have access to these “T” handles and valves.
      (2) Gate Valve: 2" and Smaller: All bronze. Non-rising stem. Threaded bonnet. Wedge disk. Malleable iron handwheel. 200 psi CWP. Nibco T-113-LF. 2-1/2" and Larger: Iron body, bronze mounted. Non-rising stem. Resilient wedge disk. 200 psi CWP. Flanged or AWWA hub end as applicable. Nibco F-619-RWS. Underground valves shall have square operating nut.
      (3) Ball Valve: Full port. Lead free brass body, cap, stem, disk and ball. Screwed connection. Lever handle. PTFE seat and stem packing. Min. 400 psi CWP. CSA-US and UL listed. Nibco T-FP-600A-LF.
      (4) Plug Valve: Valves in gas piping systems must be UL or CSA listed for gas distribution. 4" and Smaller: Eccentric bronze or nickel plated semi-steel plug. Semi-steel body. Bronze bushings. Buna-N-rings. 175 psi WOG. KeyPort Valve Series 400. 2" and smaller above grade may be listed full port ball valves, except in publicly accessible locations. Apollo, Jomar, Nibco.
      (5) Valve Box: Precast reinforced concrete. Cast iron lid marked for service. Christy F8 in foot traffic areas; G5 in roadways. Provide with PVC pipe extension down to top of pipe.
   b. Miscellaneous Specialties:
      (1) Union: 2" and Smaller: AAR malleable iron, bronze to iron ground seat. 300 psi. Unions for copper piping shall be copper or lead free cast bronze. Anvil. Size 2-1/2" and Larger: Grooved pipe, synthetic gasket, malleable iron housing. EPDM gasket, NSF 61 rated. Victaulic Style 77, Gruvlok.

(2) Dielectric Coupling: Insulating union or flange rated for 250 psig. Wilkins DUXL Series.

C. Drain Piping (including Condensate): Same as inside building cold water piping.

D. Miscellaneous Piping Items:

1. Pipe Support:
   a. Pipe Hanger: Steel "J" hanger with side bolt for piping 4" and smaller; steel clevis hanger for piping 5" and larger. Load and jam nuts. Size and maximum load per manufacturer's recommendation. Felt liner for copper piping. Hanger and rod shall have galvanized finish. B-Line, Anvil, Unistrut.
   b. Isolating Shield: Galvanized steel shell and reinforcing ribs. 1/4" non-conducting hair felt pad. Pipe hanger in accordance with paragraph above. Increase hanger size per manufacturer's recommendation. B-Line, Semco, Superstrut.
   c. Construction Channel: 12-gage, 1-5/8" x 1-5/8" galvanized steel channel. Single or multiple section. Self-locking nuts and fittings. B-Line, Anvil, Unistrut.
2. Flashing: Vent flashing shall be 4 lb/ft2 lead, 16" sq. flange, length sufficient to be turned down 2" into vent. Oatey. Flashing for other piping through roof shall be prefabricated galvanized steel roof jacks with 16" sq. flange. Provide clamp-on storm collar and seal water tight with mastic. For cold process built-up roof, material shall be 4 lb/ft$^2$ lead instead of galvanized steel. For single-ply roofing, use the roofing manufacturer’s recommended flashing material.

2.2 PIPING INSULATION MATERIALS:

A. General: All piping insulation materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.

B. Pre-Molded Fiberglass: Heavy density sectional pre-molded fiberglass with vapor barrier laminated all service jacket and pressure sealing vapor barrier lap. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft2-F at a mean temperature of 50F. Perm rating 0.02, ASTM E96. Puncture rating 50 Beach units, ASTM D781. Provide 3" (min.) wide tape of same material as lap for butt joints. For hot water piping to 140°F, thickness shall be 1" for pipe sizes less than 1”; 1-1/2" thickness for pipe sizes 1" and 1-1/2”; 2” thickness for 2” and larger. See Title 24, Part 6 “California Energy Code” for temperatures above 140°F. Knauf, Johns-Manville, Owens-Corning.

C. Fiberglass Blanket: Unfaced. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft2-F at a mean temperature of 50F. 1-1/2" thickness. Knauf, Johns-Manville, Owens-Corning.

D. PVC Jacket (for pipe, fittings and valves): Pre-molded polyvinyl chloride (PVC) jackets, 0.020" thickness. Size to match application. Provide solvent weld adhesive and PVC vapor barrier pressure sealing tape by same manufacturer. Zeston.

E. Vapor Barrier Coating: Childers CP-34, Foster 30-65. Permeance shall be 0.08 perms or less at 45 mils dry as tested by ASTM F1249.

F. Aluminum Jacketing: Aluminum pipe and fitting jacketing. 0.016" thickness for straight pipe. 0.024" thickness for fittings. Stucco-embossed finish. Integral moisture barrier. Provide pre-fabricated aluminum strapping and seals by same manufacturer. Childers.

G. Outdoor Weather Barrier Mastic: Childers CP-10/11, Foster 46-50.

H. Metal Jacketing/Flashing Sealant: Childers CP-76, Foster 95-44.

I. Insulating Tape: Ground virgin cork and synthetic elastomeric. Black, odorless, and non-toxic. K factor 0.43 Btu-in/hr-ft2-F or less. Non-shrinking. For outdoor use, provide protective finish by same manufacturer. Halstead.

2.3 FIXTURES:

A. General: Provide rough-in for and install all plumbing fixtures shown on drawings. Except in equipment rooms, all trim, valves and piping not concealed in wall structure, above ceiling or below floors, shall be brass with polished chrome plate finish, unless noted otherwise. All enameled fixtures shall be acid resisting. Standard color is white unless otherwise noted.

B. Schedule: Refer to Plumbing Fixture Schedule on the drawings for list of fixtures and trim. Manufacturer's model numbers are listed to complete description. Equivalent models of American Standard, Eljer, Elkay, Haws, Just, Kohler, Moen, T&S Brass, Willoughby or Zurn are acceptable. For drainage fixtures, equivalent models of Josam, Mifab, Smith, Wade or Zurn are acceptable.

C. Stops and P-Traps: All fixtures shall be provided with stops and P-Traps as applicable. Wall mounted faucets, valves, etc. shall have integral stops or wall mounted stops.
1. Stops: All hot and cold water supplies shall be 1/2" I.P.S. inlet angle stops with stuffing box, loose key lock shield, and brass riser (3/8" for 2-1/2 gpm and less, otherwise 1/2"). ¼ turn ball stops do not require stuffing box. Dahl, McGuire, Speedway.
2. P-Traps: Semi-cast brass, ground joint. 17-gage. Clean-out plug. Unobstructed waterway. California Tubular, McGuire.

D. Caulking: Caulk fixtures with white G.E. "Sanitary SCS1700", mildew resistant silicone sealant with EPA listed anti-microbial.

2.4 EQUIPMENT:

A. General Requirements:
1. Capacity: Capacities shall be in accordance with schedules shown on drawings. Capacities are to be considered minimum.
2. Dimensions: Equipment must conform to space requirements and limitations as indicated on drawings and as required for operation and maintenance. Equipment will not be accepted that does not readily conform to space conditions. Prepare and submit layout drawings for all proposed equipment (different than scheduled units) showing actual job conditions, required clearances for proper operation, maintenance, etc.
3. Ratings - Electrical: Electrical equipment shall be in accordance with NEMA standards and UL or ETL listed where applicable standards have been established.
4. Piping: Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be provided. Equipment requiring domestic water for non-potable use shall be provided with backflow preventer acceptable for intended use by local governing authorities.
5. Electrical:
a. General: Each item or assembly of items shall be furnished completely wired to individual terminal blocks for connection to single branch electrical circuit. All electrical accessories and controls required by equipment shall be furnished. Provide terminal blocks for controls and interlocks not included in equipment package. Manual and magnetic starters shall have ambient compensating running overcurrent protection in all ungrounded conductors. Magnetic starters shall be manual reset, and shall have H-O-A switches and auxiliary contacts. Controllers and other devices shall be in NEMA 1 or 3R enclosures as applicable.
b. Wiring: Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead

front, fused disconnect, fuse block, or circuit breaker for each ungrounded conductor, all accessible on operating side of equipment. Switches, contacts and other devices shall be in ungrounded conductors.

c. Control Voltage: Equipment connected to greater than 240 volts shall be provided with 120 volt control circuit from integral protected transformer if separate source is not indicated on plans. 240 volt control is acceptable if confined within control panel.

d. Submittals: Included in shop drawings shall be internal wiring diagrams and manufacturer's recommended external wiring.

B. Electric Drinking Fountain: Wall hung with bottle filler. Provide steel mounting brackets. Stainless steel basin. Removable grid drain. Chrome plated brass bubbler with automatic flow regulator and self-closing valve. UL listed. ARI certified. Elkay, Haws, Sunroc.

**PART 3: - EXECUTION**

3.1 PIPING INSTALLATION:

A. General:

1. Piping Layout: Piping shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Architect. No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. All piping shall be installed in a manner to ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed to permit expansion and contraction without strain on piping or equipment. Vertical lines shall be installed to allow for building settlement without damage to piping. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted.
2. Joints:
   a. Threaded: Pipe shall be cut square and reamed to full size. Threads shall be in accordance with ANSI B2.1. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only. Joints shall be made with three threads exposed.
   b. Brazed: Filler rod shall be of suitable or the same alloy as pipe. Brazing filler metal shall have a minimum melting point of 1100FBrazing shall be performed by a Certified Brazer as certified by an organization/institution that uses standards recognized by the American Welding Society (AWS) and meets the requirements of the ASME Boiler and Pressure Vessels Code, Section 9.
   c. Open Ends: Open ends of piping shall be capped during progress of work to preclude foreign matter.
   d. Electrical Equipment: Piping shall not be run over electrical panels, motor control centers or switchboards.
3. Fittings and Valves:
   a. Standard Fittings: All joints and changes in direction shall be made with standard fittings. Close nipples shall not be used.
   b. Reducers: Pipe size reduction shall be made with bell reducer fittings. Bushings shall not be used.
   c. Unions: A union shall be installed on the leaving side of each valve, at all sides of automatic valves, at equipment connections, and elsewhere as necessary for assembly or disassembly of piping.
   d. Valves: All valves shall be full line size. Provide shut-off valve for each building and each equipment connection. Provide shut-off valve at each point of connection to existing piping. At equipment connections, valves shall be full size of upstream piping.
   e. Valve Accessibility: All valves shall be located so that they are easily accessible. Valves located above ceilings shall be installed within 24" of the ceiling.

4. Pipe Support:
   a. General: Hangers shall be placed to support piping without strain on joints or fittings. Maximum spacing between supports shall be as specified below. Actual spacing requirements will depend on structural system. Side beam clamps shall be provided with retaining straps to secure the clamp to the opposite side of the beam. Vertical piping shall be supported with riser clamp at 20' on center (maximum). Support pipe within 12" of all changes in direction. Support individual pipes with pipe hanger. Copper piping systems which protrude through a surface for connection to a fixture stop or other outlet shall be secured with a drop ell, Nibco 707-3-5, to a Holdrite Model #SB1 bracket; nipple through surface shall be threaded brass.
      (1) Pressure Pipe:

| Pipe Size (Inches) | Maximum Spacing* Between Supports (ft.) | |
|---|---|---|
| | Copper | Sch. 40 steel |
| 1/2 | 6 | 6 |
| 3/4 | 6 | 8 |
| 1 | 6 | 8 |
| 1-1/4 | 6 | 10 |
| 1-1/2 | 6 | 10 |
| 2 | 10 | 10 |
| 2-1/2 | 10 | 10 |
| 3 | 10 | 10 |
| 4 | 10 | 10 |
| 6 | 10 | 10 |

      *Based on straight lengths of pipe with couplings only. Provide additional supports for equipment, valves or other fittings. Plastic piping shall be supported per the manufacturer's recommendations. Seismic requirements may reduce maximum spacing.
      (2) Gravity Drain Pipe: Piping shall be supported at each length of pipe or fitting, but in no case at greater spacing than indicated above for pressure pipe.
   b. Cold Water Piping: All cold water piping shall have isolating shield; no portion of this piping shall touch the structure without an isolating shield except at anchor points for fixture rough-in.
   c. Trapeze: Trapeze hangers of construction channel and pipe clamps may be used. Submit design to Engineer for review.
5. Miscellaneous:
   a. Escutcheons: Provide chrome plated metal escutcheons where piping penetrates walls, ceilings, or floors in finished areas.
   b. Pipe Sleeves: All piping passing through concrete shall be provided with pipe sleeves. Allow 1" annular clearance between sleeve and pipe for piping 3" and smaller, otherwise 2" annular clearance.
   c. Pipes Passing through Fire Rated Surfaces: Pipes passing through fire rated walls, floors, ceilings, partitions, etc. shall have the annular space surrounding the pipe or pipe insulation sealed with fire rated materials in accordance with the requirements of 2022 CBC Section 714.
   d. Dielectric Couplings: Dielectric couplings shall be installed wherever piping of dissimilar metals are joined, except that bronze valves may be installed in ferrous piping without dielectric couplings.
   e. Concrete Thrust Blocks: Shall be constructed at all valves, tees, elbows, bends, crosses, reducers and dead ends in loose joint pipe. Blocks shall cure a minimum of 7 days before pressure is applied. Concrete shall be 3000 psi mix.

B. Sanitary Sewer Piping:
   1. General: Where inverts are not indicated, sanitary sewer piping shall be installed at 1/4" per foot pitch. Piping 4" and larger may be installed at 1/8" per foot pitch where structural or other

limitations prevent installation at a greater pitch. Bell and spigot piping shall be installed with barrel on sand bed; excavate hole for bell.

2. Cleanouts: Install cleanouts at ends of lines, at changes of direction greater than 45 degrees, and at not greater than 100 foot intervals. Locate interior cleanouts in accessible locations and bring flush to finished surface.
3. Vents: Vents shall terminate not less than 6" above the roof nor less than 12" from any vertical surface nor within 10' of any outside air intake. Install horizontal vent lines at 1/4" per foot pitch. Offset vents 2' minimum from gutters, parapets, ridges and roof flashing.

C. Water Piping: Connections to branches and risers shall be made from top of main. Supply header in fixture battery shall be full size to last fixture, reducing in size only on individual connections to each fixture in battery. Minimum pipe size shall be 1/2", unless otherwise noted. Exposed fixture stops and flush valves shall be installed with brass nipples for copper piping and galvanized nipples for galvanized piping. Nipples are to extend from outside of wall to fitting at header or drop behind finish wall surfaces. Pipe nipples shall be same size as stop or flush valve. Provide shut off for each building and each connection to equipment. Shock absorbers shall be installed in a vertical position as indicated on drawings. Only equipment mounted on vibration isolators shall be connected with flexible connections.

D. Drain Piping (Including Condensate): Install with constant pitch to receptacle, 1/4" per foot where possible, otherwise 1/8" per foot minimum. Provide TEE with clean-out plug at all changes of direction. Provide trap at each air handling unit to prevent air leakage. Only equipment mounted on vibration isolators shall be connected with flexible connection. Piping not concealed in wall structure, above ceilings or below floors shall be chrome plated brass, except in equipment rooms, piping shall be galvanized steel. P&T relief and water heater drain piping shall be galvanized steel. Provide secondary drain piping where required.

E. Plastic Piping: Shall be cut square and assembled prior to solvent weld. Apply primer per manufacturer's recommendations. Coat male joint fully with solvent, make joint before solvent dries and wipe exterior clean.

3.2 PIPING INSULATION INSTALLATION:

A. Cold Water Piping-Freeze Protection: All cold water piping exposed to weather or other areas subject to freezing (i.e. ventilated attics, uninsulated exterior soffits, etc.) shall be insulated, 1” thick. Cover with aluminum jacketing where exposed to weather. Short lengths of pipe and valves may be wrapped with insulating tape, 50% overlap. Cover valves to stem. Apply at least two coats of protective finish where exposed to weather.

3.3 FIXTURE INSTALLATION:

A. Fixture Height: Shall be as indicated on Architectural drawings.

B. Floor Drains or Floor Sinks: Shall be placed parallel to room surfaces, set level, flush with floor, and adjusted to proper height to drain. Cover openings during construction to keep all foreign matter out of drain line.

C. Wall Hung Fixtures: Shall be provided with proper backing and hanger plates secured to wall. Fixtures mounted on carriers shall bear against stop nuts, clear of wall surface. Caulk fixtures against walls with white G.E. "Sanitary SCS1700" silicone sealant. Caulking shall be smooth and flush with fixture surface (not concave).

D. Floor Mounted Fixtures: Shall be provided with proper support plates. Caulk floor mounted fixtures with white G.E. "Sanitary SCS1700" silicone sealant. Caulking shall be smooth and flush with fixture surface (not concave).

E. Other Connections: Rough-in and connection for trim or fixtures supplied by others shall be included in this specification section.

3.4 EQUIPMENT INSTALLATION:

A. General: It shall be the responsibility of the equipment installer to insure that no work done under other specification sections shall in any way block, or otherwise hinder the equipment. All equipment shall be securely anchored in place.

B. Connections to Equipment: Where size changes are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet.

3.5 TESTS AND ADJUSTMENTS:

A. General: Unless otherwise directed, tests shall be witnessed by a representative of the Architect. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test and repair all work to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested. Tests may be made in sections, however, all connections between sections previously tested and new section shall be included in the new test.

B. Gravity Systems:
1. Sanitary Sewer: All ends of the sanitary sewer system shall be capped and lines filled with water to the top of the highest vent, 10' above grade minimum. This test shall be made before any fixtures are installed. Test shall be maintained until all joints have been inspected, but no less than 2 hours.
2. Drains (Including Condensate): Similar to Sanitary Sewer.

C. Pressure Systems:
1. General: There shall be no drop in pressure during test except that due to ambient temperature changes. All components of system not rated for test pressure shall be isolated from system before test is made.
2. Domestic Cold Water Piping: Maintain 100 psig water pressure for 4 hours.
3. Backflow Preventer: All backflow preventers shall be tested according to manufacturer's recommendations and the USC Cross Connection Control and Hydraulic Research Manual (8th Edition). Testing shall be performed by an AWWA Certified Backflow Prevention Assembly Tester. Contractor shall certify in writing to the Architect the date which backflow preventers were tested and by whom test was witnessed.

D. Fixtures: Provide torque testing of water closet carrier anchor bolts in presence of Inspector. If Inspector is not available, a testing agency shall handle the inspection.

3.6 DISINFECTION:

A. Disinfect all domestic water piping systems in accordance with 2022 CPC Section 609.10, and in accordance with administrative authority. Disinfection process shall be performed in cooperation with health department having jurisdiction and as required by applicable codes in presence of Inspector of Record (IOR). During procedure signs shall be posted at each water outlet stating, "Chlorination Do Not Drink". Contractor shall notify the IOR 48 hours prior to the need for testing so the IOR can make arrangements for the testing laboratory to collect samples and test the water. Samples shall be taken at the furthest point of each building. Contractor shall obtain a copy of the test results from the Testing laboratory and shall provide copies to the Architect, IOR and Owner before project completion. If the water fails the bacteriological test, Contractor shall disinfect the piping again and pay for any retesting required, at no additional cost to owner. Contractor shall include copy of Bacteriological Test Results at closeout with operation and maintenance manuals.

**END OF SECTION 22 0000**

## SECTION 23 0000 - GENERAL MECHANICAL PROVISIONS

### PART 1: GENERAL

1.1 GENERAL CONDITIONS:

A. The preceding General and Special Conditions and Divisions 00 and 01 requirements shall form a part of this Section with the same force and effect as though repeated here. The provisions of this Section shall apply to all of the Sections of Divisions 22 and 23 of these Specifications and shall be considered a part of these sections.

1.2 CODES AND REGULATIONS:

A. All work and materials shall be in full accordance with current rules and regulations of all applicable codes. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes. Should the Drawings or Specifications call for material or methods of construction of a higher quality or standard than required by these codes, the Drawings and Specifications shall govern. Applicable codes and regulations include, but are not necessarily limited to, the following:

1. California Code of Regulations (CCR):
    a. Title 8, Industrial Relations
    b. Title 24, Part 1, Administrative Regulations
    c. Title 24, Part 6, California Energy Code, 2022 Edition
    d. Title 24, Part 11, California Green Building Code, 2022 Edition
2. California Building Code - CBC - 2022
3. California Mechanical Code - CMC - 2022
4. California Plumbing Code - CPC - 2022
5. California Fire Code - CFC - 2022
6. California Electrical Code - CEC - 2022
7. Air Diffusion Council - ADC
8. Air Movement and Control Association - AMCA
9. American National Standards Institute - ANSI
10. Air Conditioning and Refrigeration Institute - ARI
11. American Society of Heating, Refrigerating, and Air Conditioning Engineers - ASHRAE
12. American Society of Mechanical Engineers - ASME
13. American Society for Testing and Materials - ASTM
14. American Water Works Association - AWWA
15. Cast Iron Soil Pipe Institute - CISPI
16. National Electrical Manufacturers Association - NEMA
17. National Fire Protection Association - NFPA
18. National Sanitation Foundation - NSF
19. Occupational Safety and Health Act - OSHA
20. Plumbing and Drainage Institute - PDI
21. Sheet Metal and Air Conditioning Contractors National Association - SMACNA
22. Underwriters' Laboratory - UL

1.3 PERMITS AND FEES:

A. The Contractor shall take out all permits and arrange for all tests in connection with his work as required by Section 01 1100. All charges shall be included in the work.

1.4 COORDINATION OF WORK:

A. Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. Some work may be shown offset for clarity. The actual locations of all materials, piping, ductwork, fixtures, equipment, supports, etc. shall be carefully planned prior to installation of any work in order to avoid all interference with each other, or with structural, electrical, architectural or other elements. Verify the proper voltage and phase of all equipment with the electrical plans. If discrepancies are discovered between drawing and specification requirements, the more stringent requirement shall apply. All conflicts shall be called to the attention of the Architect and the Engineer prior to the installation of any work or the ordering of any equipment. No work shall be prefabricated or installed prior to this coordination. No costs will be allowed to the Contractor for any prefabrication or installation performed prior to this coordination.

1.5 GUARANTEE:

A. Guarantee shall be in accordance with the General Conditions. These Specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the certificate of guarantee shall be furnished to the Owner through the Architect. Equipment that is started and operated prior to acceptance shall have the guarantee extended to cover that period. Owner guarantee shall start at acceptance.

1.6 QUIETNESS:

A. Piping, ductwork and equipment shall be arranged and supported so that vibration is a minimum and is not transmitted to the structure.

1.7 DAMAGES BY LEAKS:

A. The Contractor shall be responsible for damages caused by leaks in the temporary or permanent piping systems prior to completion of work and during the period of the guarantee, and for damages caused by disconnected pipes or fittings, and the overflow of equipment prior to completion of the work.

1.8 EXAMINATION OF SITE:

A. The Contractor shall examine the site, compare it with Plans and Specifications, and shall have satisfied himself as to the conditions under which the work is to be performed. No allowance shall subsequently be made in his behalf for any extra expense to which he may be put due to failure or neglect on his part to make such an examination.

1.9 COMPATIBILITY WITH EXISTING SYSTEMS:

A. Any work which is done as an addition, expansion or remodel of an existing system shall be compatible with that system.

1.10 MATERIALS AND EQUIPMENT:

A. Materials and equipment shall be new unless otherwise noted. Materials and equipment of a given type shall be by the same manufacturer. Materials and equipment shall be free of dents, scratches, marks, shipping tags and all defacing features at time of project acceptance. Materials and equipment shall be covered or otherwise protected during construction as required to maintain the material and equipment in new factory condition until project acceptance.

1.11 SUBMITTALS:

A. Shop Drawings: Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc. proposed for use on this project. Material or equipment shall not be ordered

or installed until written review is processed by the Engineer. Any item omitted from the submittal shall be provided as specified without substitution.

All shop drawings must comply with the following:

1. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the specifications or on the drawings. Descriptive literature shall be current factory brochures and submittal sheets. Capacities shall be certified by the factory. FAX submittals are not acceptable.
2. All shop drawings shall be submitted at one time in a neat and orderly fashion in a suitable binder with title sheet including Project, Engineer and Contractor, table of contents, and indexed tabs dividing each group of materials or item of equipment. All items shall be identified by the specification paragraph number for which they are proposed. All equipment shall also be identified by the mark number as indicated on drawings.
3. All capacities, characteristics, and accessories called for in the specifications or on the drawings shall be high-lighted, circled or underlined on the shop drawings. Calculations and other detailed data indicating how the item was selected shall be included for items that are not scheduled. Data must be complete enough to permit detailed comparison of every significant characteristic which is specified, scheduled or detailed.
4. Electronic Submittals: Where allowed by Division 01, electronic submittals are acceptable providing the following requirements are met. Electronic submittals which do not comply with these requirements will be rejected.
    a. Submittal shall be a single file in PDF format, with bookmarks for table of contents and each tab, and sub-bookmarks for each item.
    b. All text shall be searchable (except text that is part of a graphic).
    c. Submittal shall include all items noted in 1 through 3 above, except a binder is not required.
    d. Electronic submittals shall be processed through normal channels. Do not submit directly to the Engineer unless the Engineer is the prime consultant for the project.
    e. Contractor shall provide Owner and Owner’s Representative with hard copies of the final submittal. Coordinate exact number required with Owner through Architect/Engineer.

B. Substitutions: Manufacturers and model numbers listed in the specifications or on the drawings represent the standard of quality and features desired (where equipment is scheduled on the drawings, any equipment submitted other than scheduled equipment is considered a substitution). Unless otherwise noted, alternate manufacturers may be submitted for review by the Engineer. Calculations and other detailed data indicating how the item was selected shall be included. The Contractor shall assume full responsibility that substituted items or procedures will meet the specifications and job requirements and shall be responsible for the cost of redesign and modifications to the work caused by these items. At the Engineer's request, furnish locations where equipment similar to the substituted equipment is installed and operating along with the user's phone numbers and contact person. Satisfactory operation and service history will be considered in the acceptance or rejection of the proposed substitution.

C. Review: Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment and installation in accordance with the drawings and specifications. The Contractor shall agree that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use. The Contractor shall agree that if deviations, discrepancies or conflicts between shop drawings and design drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed. If a resubmittal is required, submit a complete copy of the Engineer's review letter requiring such with the resubmittal.

1.12 MANUFACTURER'S RECOMMENDATIONS:

A. All material, equipment, devices, etc., shall be installed in accordance with the recommendations of the manufacturer of the particular item. The Contractor shall be responsible for all installations contrary to the manufacturer's recommendations. The Contractor shall make all necessary changes and revisions to achieve such compliance. Manufacturer's installation instructions shall be delivered to and maintained at the job site through the construction of the project.

1.13 SCHEDULING OF WORK:

A. All work shall be scheduled subject to the review of the Architect, Engineer and the Owner. No work shall interfere with the operation of the existing facilities on or adjacent to the site. The Contractor shall have at all times, as conditions permit, a sufficient force of workmen and quantity of materials to install the work contracted for as rapidly as possible consistent with good work, and shall cause no delay to other Contractors engaged upon this project or to the Owner.

1.14 OPENINGS, CUTTING AND PATCHING:

A. The locations and dimensions for openings through walls, floors, ceilings, foundations, footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. Except as noted below, the actual openings and the required cutting and patching shall be provided by other Divisions. Coring through existing concrete or masonry walls, floors, ceilings, foundations, footings, etc., and saw cutting of concrete floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Patching of these surfaces shall be provided by other Divisions. Cutting or coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Architect.

1.15 EXCAVATION AND BACKFILL:

A. General: Barrel of pipe shall have uniform support on sand bed. Sand shall be free from clay or organic material, suitable for the purpose intended and shall be of such size that 90 percent to 100 percent will pass a No. 4 sieve and not more than 5 percent will pass a No. 200 sieve. Unless otherwise noted, minimum earth cover above top of pipe or tubing outside building walls shall be 24", not including base and paving in paved areas.

B. Excavation: Width of trenches at top of pipe shall be minimum of 16", plus the outside diameter of the pipe. Provide all shoring required by site conditions. Where over excavation occurs, provide compacted sand backfill to pipe bottom. Where groundwater is encountered, remove to keep excavation dry, using well points and pumps as required.

C. Backfill:
1. 6" Below, Around, and to 12" Above Pipe: Material shall be sand. Place carefully around and on top of pipe, taking care not to disturb piping, consolidate with vibrator.
2. One Foot Above Pipe to Grade: Material shall be sandy or silty loam, free of lumps, laid in 6" layers, uniformly mixed to proper moisture and compacted to required density. If backfill is determined to be suitable and required compaction is demonstrated by laboratory test, water compaction in 6" layers may be used, subject to review by Engineer.

D. Compaction: Compact to density of 95% within building and under walkways, driveways, traffic areas, paved areas, etc. and to 90% elsewhere. Demonstrate proper compaction by testing at top, bottom and one-half of the trench depth. Perform these tests at three locations per 100' of trench.

1.16 PROTECTIVE COATING FOR UNDERGROUND PIPING:

A. All ferrous pipe below grade (except cast iron) shall have a factory applied protective coating of extruded high density polyethylene, 35 to 70 mils total thickness, X-Tru-Coat, Scotchkote. All fittings and areas of damaged coating shall be covered with two layer double wrap of 10 mil polyvinyl tape to total thickness of 40 mils. Johns-Manville. Protective coating shall be extended 6" above surrounding grade.

1.17 ACCESS DOORS:

A. Provide access doors as required where equipment, piping, valves, ductwork, etc. are not otherwise accessible. Access doors shall match the wall or ceiling finish and fire rating as indicated on the Architectural drawings. 16-gage steel frame and 14-gage steel door with paintable finish, except in ceramic tile, where door shall be 16-gage stainless steel with satin finish. Continuous hinge. Key and cylinder lock (except quick-opening type for Emergency Gas Shutoff Valve). Deliver doors to the General Contractor for installation. Milcor. Unless otherwise noted, the minimum sizes shall be as follows:

| | |
|---|---|
| 1 valve up to 1-1/2" | 12" x 12" |
| 1 valve up to 3" | 16" x 16" |

1.18 CONCRETE ANCHORS:

A. Steel bolt with expansion anchor requiring a drilled hole powder driven anchors, adhesive anchors and concrete screws are not acceptable. Re-use of screw anchor holes shall not be permitted. Minimum concrete embedment shall be 4 1/2 diameters. Minimum spacing shall be 12 diameters center to center and 6 diameters center to edge of concrete. Post-installed anchors in concrete used for component anchorage shall be pre-qualified for seismic application in accordance with ACI 355.2 and ICC-ES AC193. Post-installed anchors in masonry used for component anchorage shall be pre-qualified for seismic applications in accordance with ICC-ES AC01. Maximum allowable loads for tension and shear shall be as determined by Calculation in compliance with ACI 318-19, Chapter 17, and the anchor’s ICC or IAPMO evaluation report. Hilti, Powers, Red Head.

1.19 EQUIPMENT ANCHORING:

A. All equipment shall be securely anchored in accordance with ASCE 07-16, Chapter 13, as amended by CBC Section 1617.1. All equipment mounted on concrete shall be secured with a concrete anchor as shown on drawings at each mounting point.

1.20 SUPPORTS AND SEISMIC RESTRAINTS:

A. All mechanical systems (equipment, ductwork, piping, etc.) shall be provided with supports and seismic restraints in accordance with ASCE 07-16, Chapter 13, as amended by CBC Section 1617.1. Brace spacing shall be reduced by 50% for cast iron, plastic, no-hub, or other non-ductile piping. A copy of this manual shall be kept on site at all times during construction.

1.21 ASBESTOS CONTAINING MATERIALS:

A. No materials or material coatings containing asbestos shall be allowed on this project.

1.22 SYSTEM IDENTIFICATION:

A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, either by pre-printed markers or stenciled marking, and include arrows to show direction of flow. Pre-printed markers shall be the type that wrap completely around the pipe, requiring no other means of fastening such as tape, adhesive, etc. Comply with ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and

other interruptions including equipment in the line, where lines pass through floors, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portions of lines. Marking of short branches and repetitive branches for equipment connections is not required.

B. Below Grade Piping: Bury a continuous, pre-printed, bright-colored, metallic ribbon marker capable of being located with a metal detector with each underground pipe. Locate directly over buried pipe, 6" to 8" below finished grade.

C. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. AC-4) and identifies the area or space served by the equipment. Provide 1/2" high lettering - white on black background. Nameplates shall be permanently secured to the exterior of the unit.

1.23 CLEANING:

A. Progressively and at completion of the job, the Contractor shall thoroughly clean all of his work, removing all debris, stain and marks resulting from his work. This includes but is not limited to building surfaces, piping, equipment and ductwork, inside and out. Surfaces shall be free of dirt, grease, labels, tags, tape, rust, and all foreign material.

B. At the end of each work day, the Contractor shall cover all open ends of piping and ductwork with protective plastic.

1.24 ACCEPTANCE TESTING:

A. All acceptance testing as required by California Code of Regulations, Title 24, and as noted on the Certificate of Compliance form, (where applicable), shall be performed and documented by an Acceptance Test Technician (ATT). These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). The Contractor shall submit a copy of the documentation to the Engineer for review (hardcopy or electronic), prior to submitting to Administrative Authority.

1.25 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. Printed: Three copies of Operation and Maintenance Instructions and Wiring Diagrams for all equipment and parts list for all faucets, trim, valves, etc. shall be submitted to the Engineer. All instructions shall be clearly identified by marking them with the same designation as the equipment item to which they apply (e.g. AC-3). All Wiring Diagrams shall agree with reviewed Shop Drawings and indicate the exact field installation. All instructions shall be submitted at the same time and shall be bound in a suitable binder with tabs dividing each type of equipment (e.g. Pumps, Fans, Motors, etc.). Each binder shall be labeled indicating "Operating and Maintenance Instructions, Project Title, Contractor, Date" and shall have a Table of Contents listing all items included. Electronic O & M’s shall comply with the Electronic submittal requirements in this Section.

B. Verbal: The Contractor shall verbally instruct the Owner's maintenance staff in the operation and maintenance of all equipment and systems. The controls contractor shall present that portion of the instructions that apply to the control system. The Engineer's office shall be notified 48 hours prior to this meeting.

1.26 RECORD DRAWINGS:

A. The Contractor shall obtain one set of blue line prints for the project, upon which a record of all construction changes shall be made. As the work progresses, the Contractor shall maintain a record of all deviations in the work from that indicated on the drawings. Final location of all underground work shall be recorded by depth from finished grade and by offset distance from permanent surface structures, i.e. building, curbs, walks. In

addition, the water, gas, sewer, underfloor duct, etc. within the building shall be recorded by offset distances from building walls. The original drawings will be made available to the Contractor from which he shall have a set of reproducible drawings made. The Contractor shall then transfer the changes, notations, etc. from the marked-up prints to the reproducible drawings. The record drawings (marked-up prints and reproducibles) shall be submitted to the Engineer for review.

**PART 2: PRODUCTS (not used)**

**PART 3: EXECUTION (not used)**

**END OF SECTION 23 0000**

**SECTION 23 0001 - HEATING, VENTILATING AND AIR CONDITIONING**

**PART 1: GENERAL**

1.1 GENERAL MECHANICAL PROVISIONS:

A. The General Mechanical Provisions, Section 23 0000, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

A. Included: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Air distribution system.
2. All equipment as shown or noted on the drawings or as specified. Furnish motor starters except where motor control centers are used. Coordinate with Division 26.
3. System energy balance.
4. Temperature control system.
5. Demolition as indicated on drawings. Where demolition is called for, remove all equipment, piping, ductwork, braces, supports, housekeeping pads, temperature controls and related items no longer required.

B. Work Specified Elsewhere:
1. Line voltage power wiring, disconnect switches and installation of all starters are included in the Electrical Section, unless otherwise noted.
2. Connection of condensate drains to equipment.
3. Concrete and reinforcing steel unless specifically called for in the drawings or specifications.
4. Painting unless specifically called for in the drawings or specifications.
5. Carpentry.

**PART 2: PRODUCTS**

2.1 DUCTWORK MATERIALS:

A. General: All ductwork materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50. Shall comply with 2022 CMC.

B. Metal Ductwork: Metal ductwork shall be galvanized sheet steel, lock forming quality, ASTM A-653, with gage and construction to match SMACNA Standard for pressure required (26 gage minimum).

C. Flexible Ductwork: Insulated flexible ductwork. One pound per cubic foot glass fiber insulation, 1-1/2" thick (R-6), 2” thick (R-8) where ductwork is outside the building thermal insulation envelope. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft2-ºF at a mean temperature of 75ºF. Seamless metalized reinforced polyester vapor barrier jacket. Duct shall comply with NFPA 90A. Continuous internal liner bonded to galvanized steel wire helix. Duct shall be capable of continuous operation at 1-1/2" of positive water static pressure and 4,000 ft/min air velocity. JP Lamborn.

D. Duct Sealants: All Joints Exposed to Weather: Sealant shall be water based, Foster 32-19/32-17, Childers CP-146/148, United Duct Sealer WB or G.E. “SilPruf” SCS2000 silicone sealant. Joints Not Exposed to Weather: Fiber reinforced. White in color. Foster 32-17, Childers CP-148, Design Polymerics DP1030, Hardcast Versa-Grip 181, Hardcast CCWI-181.

2.2 AIR TERMINALS AND DUCT FITTINGS:

A. Grilles: (Grilles, Registers, Diffusers and Louvers)

1. Information on Drawings: Refer to Grille Schedule on the drawings for the list of grilles. Manufacturer's model numbers are listed to complete the description Titus. Equivalent models of Anemostat or Krueger are acceptable. Refer to the floor plans for neck size, CFM, air diffusion pattern and fire damper, if required.
2. Performance: Submit complete performance data (throw, pressure drop, noise level, etc.) for all grilles proposed, other than those scheduled. Testing shall be in accordance with ANSI/ASHRAE 70-1991. If, according to the certified data of the manufacturer of the proposed units, the sizes indicated on the drawings will not perform satisfactorily, the units shall be reselected by the Contractor for the proper diffusion, spread, pressure drop, throw and noise level.
3. Frame and Accessories: Supply, return, and exhaust grilles shall not have an opposed blade volume control damper unless otherwise noted. All surface mounted grilles shall have a perimeter gasket and flanged edge. All grilles shall have frames suitable for mounting in the surfaces designated by the architectural drawings. Key or screwdriver operated, no slide bars.
4. Finish: All ceiling and wall grilles and all louvers shall have a paintable white finish unless otherwise noted. Interior components (everything behind the face plate) shall be flat black. Floor grilles shall have an anodized aluminum finish unless otherwise noted.

B. Branch Duct Volume Damper: Volume control damper (VCD) in rectangular ducts shall be as follows: Opposed blade, 6" maximum blade width, 16-gage blade, 48" maximum length, nylon or oil impregnated bronze bearings, 1/2" diameter pin shaft, 16-gage channel frame, actuating rod and linkage out of air stream. VCD in round duct shall be as follows: Damper blade full height of branch and 1" less than branch width. All branch dampers shall have regulator with stamped steel handle, spring loaded shaft nut, cast body and serrated self-locking die cast core. Regulator for horizontal ducts overhead shall be mounted on sides or bottom of ducts. Secure a 12" length of brightly colored plastic ribbon to handle for ease of location. Where rectangular or round ductwork is insulated, slit insulation to allow handle to protrude. Ventlok 641 (with 607 end bearing for round ducts).

C. Flexible Connection: UL listed neoprene coated 30-ounce fiberglass cloth. 3" metal, 3" fabric, 3" metal. Ventglas.

D. Turning Vanes: Double wall, hollow metal, air foil shape. Spacing in accordance with manufacturer's recommendations. Aero Dyne HEP.

2.3 DUCTWORK INSULATION MATERIALS:

A. General: All ductwork insulation materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.

B. Fiberglass Blanket: **Installed** thermal resistance at a mean temperature of 75ºF shall meet or exceed indicated value. 3/4 lb/ft3 or 1 lb/ft3, **R-6** where ductwork is within the building thermal insulation envelope. 3/4 lb/ft3, **R-8** where ductwork is outside the building thermal insulation envelope and/or above the roof. Faced with glass reinforced foil laminated to Kraft paper. Certainteed, Knauf, Johns-Manville, Owens-Corning.

C. Acoustic Lining: Glass fiber duct liner, ASTM C1071 and C1104. Installed thermal resistance at a mean temperature of 75°F shall meet or exceed indicated value. One side coated to prevent fiber erosion up to 6000 ft/min. Average noise reduction coefficient of 0.80. 1.5 lb/ft$^3$ density. 1" thick (**R-4.2**) where ductwork is within the building thermal insulation envelope. 2" thick (**R-8**) where ductwork is outside the building thermal insulation envelope and/or above the roof. Certainteed, Knauf, Johns-Manville, Owens-Corning.

D. Bonding Adhesive: Design Polymerics DP2501, Foster 85-60.

2.4 EQUIPMENT:

A. General Requirements:

1. Capacity: Capacities shall be in accordance with schedules shown on drawings. Capacities are to be considered minimum.
2. Dimensions: Equipment must conform to space requirements and limitations as indicated on drawings and as required for operation and maintenance. Where Architectural screening is indicated, equipment shall not extend above or beyond screening. Equipment will not be accepted that does not readily conform to space conditions. Prepare and submit layout drawings for all proposed equipment (different than scheduled units) showing actual job conditions, required clearances for proper operation, maintenance, etc.
3. Ratings - Electrical: Electrical equipment shall be in accordance with NEMA Standards and UL or ETL listed where applicable standards have been established.
4. Piping: Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be provided. Equipment requiring domestic water for non-potable use shall be provided with backflow preventer acceptable for intended use by local governing authorities.
5. Electrical:
   a. General: Each item or assembly of items shall be furnished completely wired to individual terminal blocks for connection to single branch electrical circuit. All electrical accessories and controls required by equipment shall be furnished. Provide terminal blocks for controls and interlocks not included in equipment package. Manual and magnetic starters shall have ambient compensating running overcurrent protection in all ungrounded conductors. Magnetic starters shall be manual reset, shall have H-O-A switches and auxiliary contacts. Controllers and other devices shall be in NEMA 1 or 3R enclosures as applicable.
   b. Wiring: Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead front, fused disconnect, fuse block, or circuit breaker for each ungrounded conductor, all accessible on operating side of equipment. Switches, contacts and other devices shall be in ungrounded conductors.
   c. Motors: Shall be rated, constructed and applied in accordance with NEMA and ANSI Standards without using service factor. Single-phase motor shall be of type to suit application. Three-phase motors shall be open drip proof, NEMA B design on pumps and fans, NEMA C on reciprocating equipment, sealed ball bearing, three-phase induction unless otherwise noted. Design shall limit starting inrush current and running current to values shown on drawings. Motors 1 horsepower and larger shall be the premium efficiency type, tested according to IEEE Standard 112, Method B. Motors exposed to weather shall be TEFC. Motors in a fan air stream shall be TEFC or TEAO. Vertical motors outdoors shall be ODP or TEFC and shall have rain caps.
   d. Starters: Motor starters shall be furnished for all equipment except where starter is in a motor control center as designated on the electrical drawings. Deliver starter to Electrical Contractor for installation and wiring.
   e. Control Voltage: Equipment connected to greater than 240 volts shall be provided with 120 volt control circuit from integral protected transformer if separate source is not indicated on plans. 240 volt control is acceptable if confined within control panel.
   f. Submittals: Included in shop drawings shall be internal wiring diagrams and manufacturer's recommended external wiring.
6. Fan Selection:
   a. Fan Curves: Performance curves shall be submitted for all units of 3000 CFM or greater. Operating point for forward curved fans shall be from point of maximum efficiency toward increased CFM limited by horsepower scheduled. Operating point for backward inclined

fans shall be selected near point of maximum efficiency. Curves shall plot CFM verses static pressure with constant brake horsepower, RPM and efficiency lines.

b. Static Pressure: Unless otherwise noted, pressure scheduled as external static pressure (ESP) includes all ductwork and accessory losses external to the unit housing. Unless otherwise noted, pressure scheduled as total static pressure includes all ductwork, filter, coil, cabinet, damper and other accessory losses. Unless otherwise noted, pressure scheduled as duct static pressure includes all supply and return ductwork and accessory losses external to the unit housing and plenum (as applicable). The allowance for filter losses is 0.3" WC, unless otherwise noted. Submit itemized static pressure losses for all components.

7. Filters:
   a. General: Tested and rated in accordance with ASHRAE Standard 52.2 and Title 24, C.C.R. Furnish and install one complete change of all filters prior to air balance and after air balance is completed, prior to acceptance.
   b. Filter Media: 2" media. MERV-13. Clean filter resistance 0.41" water at 500 fpm. Throw-away frame. Class 2. Camfil AP-Thirteen.
8. Screens: All duct or louver openings to the outside shall be covered with 1/2", 16-gage, galvanized wire mesh screen.
9. Mixing Dampers: Opposed blade, 16-gage. Six-inch maximum blade width, 48" maximum length. Nylon or oil impregnated bronze bearings. One-half inch diameter pin shaft. 16-gage channel frame. One percent maximum leakage at 4" WC in accordance with AMCA 500 for outside air dampers. Actuating rod out of air stream. Arrow.
10. Sound Ratings: Shall be in accordance with ASHRAE 36 - 72. Sound ratings shall not exceed scheduled values.
11. Drives: Unless noted as direct connected, drives shall be V-belt, rated at 150% of motor horsepower. Multiple drive belts shall be matched set. Drive sheaves shall be dynamically balanced, adjustable, range +/- 10%, selected at mid range. Adjustable relative movement shall be lockable to shaft. Belts shall be aligned within 1-1/2 degrees at all times. Open drives shall be provided with OSHA approved open mesh belt guards. Belt guards exposed to weather shall be weatherproof enclosure with louvered face for adequate ventilation. Driving motor shall be mounted on adjustable rails. T.B. Woods, Browning. Submit RPM range of driven machine with drive selection.

B. Exhaust Fan:

1. General: All exhaust fans shall be tested and rated in accordance with AMCA Standard 210. Fans exposed to weather shall have ventilated weatherproof housing over motor and drive assembly. Refer to Paragraph 2.6A for general requirements. All direct drive fans shall be provided with unit mounted speed controllers. All exhaust fans shall have a disconnect switch. All motors 1 horsepower and larger shall be the premium efficiency type.
2. Ceiling Fan: Direct driven, centrifugal exhaust fan. Fan wheel housing and integral outlet duct shall be galvanized steel or injection molded from a specially engineered resin exceeding UL requirements for smoke and heat generation. Outlet duct shall have an aluminum backdraft damper with continuous aluminum hinge rod. Inlet box shall be minimum 22-gauge galvanized steel. Motor shall be isolation mounted to a one piece galvanized stamped steel integral motor mount/inlet. Provide a field wiring compartment with disconnect receptacle. Provide an adjustable prepunched mounting bracket to accommodate different ceiling thickness. Provide a powder painted white aluminum egg-crate grille. Unit shall be designed with provision for field conversion from ceiling to in-line. Wheel shall be centrifugal forward curved type, galvanized steel or injection molded of polypropylene resin. Motor shall be open drip proof type with permanently lubricated sealed bearings and include impedance or thermal overload protection and disconnect plug. Greenheck.

**PART 3: EXECUTION**

3.1 DUCTWORK INSTALLATION:

A. General:
1. Standards: Unless otherwise noted, all ductwork shall be constructed and installed in accordance with current SMACNA Standards. Ductwork shall be built to a pressure classification equal to or greater than the maximum operating pressure at that point in the ductwork. A copy of these standards shall be maintained at the job site at all times. Duct work and accessories shall be installed in a manner to prevent vibration and rattling.
2. Access: Provide duct access doors as required to adjust equipment and dampers. Provide wall or ceiling access panels, or remote actuators as required where equipment and dampers are not otherwise accessible.
3. Flanges and Escutcheon: Where ductwork penetrates walls, ceilings, or floors, furnish and install flange or escutcheon of same material as duct.

B. Low Velocity-Low Pressure (up to 2,000 ft/min and up to 2.0 in water):
1. Sheet Metal Ductwork:
a. Ells: Ells with less than standard radius and square ells shall be fitted with turning vanes.
b. Tees: Tees in supply ductwork shall be straight tap-in with extractor or 45 degree take-off as shown on drawings. Grilles or branches in supply ductwork shall be a minimum of 8 duct diameters downstream of tees.
c. Duct Joints and Seams: All joints and seams which are not exposed to weather shall be sealed airtight with duct sealant. All joints and seams exposed to weather shall be sealed air and water tight with silicone sealant. (See Part 2 of this Specification). All joints on spiral wound metal ductwork not exposed to weather shall be sealed air tight with grey duct sealant.
d. Dampers: Install volume control damper and damper regulator in all branch ducts.
2. Flexible Glass Fiber Ductwork: The use of flexible duct is limited to the last 5 feet of each branch duct (i.e. one 5-foot section of flexible duct may be used to connect the grille to the sheet metal branch duct). No joints are permitted in this 5' length. Hangers shall be 4" wide metal straps spaced to prevent sagging, 42" spacing maximum. Insert 6" wide fiberglass pad between duct and hanging strap. Joints shall be installed with stainless steel or nylon draw bands, Duro Dyne Dyn-O-Tie. Minimum turn radius of duct centerline not less than 1.5 times the duct diameter. Install without excess length. Ducts shall not be compressed.

3.2 AIR TERMINALS AND DUCT FITTINGS INSTALLATION:

A. General: Unless otherwise noted, all air terminals and duct fittings shall be installed in accordance with current SMACNA Standards. Terminals and fittings shall be installed in a manner to prevent vibration and rattling. Metal surfaces exposed to view behind grilles and registers shall be painted flat black.

3.3 DUCTWORK INSULATION INSTALLATION:

A. General: Insulate all sheet metal supply, return and outside air intake ductwork except as noted below. Insulation shall be continuous through walls and floors except at fire dampers.

B. Where Insulation Is Not Required: Do not insulate factory-insulated ducts or casings, acoustic lined ducts, fibrous glass ducts, underground ductwork, supply or return ductwork exposed to view in the space that it serves, or exhaust ductwork.

C. Acoustic Lining: Unless otherwise indicated, all supply and return ductwork in equipment rooms, all ductwork exposed to weather and other ducts as indicated on drawings, shall have acoustic lining. Do not acoustic line outside air intakes. Where acoustic lining is installed, increase each sheet metal dimension to accommodate lining and maintain clear inside duct dimensions shown on drawings. Apply lining with

bonding adhesive in accordance with manufacturer's recommendations and also secure with mechanical fasteners in accordance with SMACNA Standards. Seal exposed edges of lining with bonding adhesive.

3.4 EQUIPMENT INSTALLATION:

A. General: It shall be the responsibility of the equipment installer to ensure that no work done under other specification sections shall in any way block or otherwise hinder the equipment. All equipment shall be securely anchored in place. All equipment shall be installed level.

B. Connections to Equipment: Where size changes are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet.

3.5 TESTS AND ADJUSTMENTS:

A. General: Unless otherwise directed, tests shall be witnessed by a representative of the Architect. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test and repair all work to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested.

3.6 SYSTEM ENERGY BALANCE:

A. Scope: Provide the services of an independent test and balance agency to test, adjust and balance, retest and record performance of the system to obtain design quantities as specified. The agency must prove that they have no affiliation with any equipment manufacturer, design engineer, installing contractor, or any other party which might lead to a conflict of interest, in order to provide an unbiased, third party system balance and report.

B. Qualifications: Prior to commencing work, the agency shall be reviewed by the Engineer and shall be certified by the Associated Air Balance Council, National Environmental Balancing Bureau or Testing, Adjusting and Balancing Bureau. The agency shall provide documentation of having successfully completed at least five projects of similar size and scope.

C. Instruments: All instruments shall be accurately calibrated; calibration histories shall be available for examination. Application of instrumentation shall be in accordance with AABC, NEBB or TABB standards.

D. Submittals: Include in shop drawings copies of forms to be used for testing and balancing showing all data which is to be recorded. Seven copies of completed balance report shall be submitted to and reviewed by the Mechanical Engineer prior to the final mechanical construction review.

E. Procedure - General: Procedure shall be in accordance with Associated Air Balance Council's "National Standards for Field Measurements and Instrumentation - Total System Balance", Volume Two, No. 12173, or equivalent NEBB or TABB standards. System shall be in full, continuous operation during test. Balanced quantities shall be plus 10%, minus 0% of design quantities. All nameplate data, manufacturer, model and serial numbers shall be recorded for each item tested.

F. Extended Warranty: The test and balance agency shall include an extended warranty of 90 days after completion of test and balance work, during which time the Engineer, at his discretion, may request a recheck or resetting of any item or items in test report. The agency shall provide technicians to assist the Engineer in making any tests he may require during this period of time.

G. Air Balance Procedure (For Each Air Handling System):
1. All air filters shall be clean when air balance is performed.
2. Provide a sketch of the equipment showing exactly where all pressure readings were taken.
3. Adjust blower RPM to design requirements.

4. Record motor full load amperes.
5. Make pitot tube traverse of main supply and return ducts and obtain design CFM at fans.
6. Record system static pressures, inlet and discharge.
7. Record filter quantity, size(s) and pressure drop across filter(s) at each filter bank.
8. Adjust system for design CFM recirculated air.
9. Adjust system for design CFM outside air.
10. Record entering air temperatures. (DB heating, DB and WB cooling.)
11. Record leaving air temperatures. (DB heating, DB and WB cooling.)
12. Adjust all main supply and return air ducts to design CFM.
13. Adjust all zones to design CFM, supply and return.
14. Adjust all diffusers, grilles and registers to plus 10%, minus 0% of design requirements.
15. Adjust CFM at all exhaust fans, make-up units, etc. (high and low speed, where applicable). Record applicable data from items 1 through 11 above.
16. Each grille, diffuser and register shall be identified as to location.
17. Verify proper diffusion pattern for all ceiling grilles and that all sidewall grilles are set for 5 degrees upward deflection unless otherwise noted. Make a notation of any that are not set properly.
18. Size, type and manufacturer of diffusers, grilles, registers and all tested items shall be identified and listed. Manufacturer's ratings shall be used to make required calculations on all items.
19. Readings and tests of diffusers, grilles, and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.
20. In cooperation with the control manufacturer's representative, set adjustments of automatically operated dampers to operate as specified. Testing agency shall check all controls for proper calibrations and list all controls requiring adjustment by control installers.
21. All diffusers, grilles and registers shall be adjusted for required air patterns and to minimize drafts.
22. As a part of the work of this contract, THE AIR CONDITIONING CONTRACTOR shall make any changes in pulleys, belts and dampers or the addition of dampers required for correct balance as recommended by air balance agency, at no additional cost to Owner.
23. Set, test and adjust packaged heating/cooling unit economizer operation in cooperation with controls contractor. Record minimum and maximum outside and exhaust airflows.
24. Verify that the Controls Contractor has commissioned and documented their work before the TAB work begins.

3.7 TEMPERATURE CONTROL SYSTEM:

A. Scope: The control system includes control panels, control devices, line and low voltage control and interlock wiring, conduit and related equipment as required for proper operation of all controlled systems. Control and interlock wiring includes wiring to controllers, switches, timers, relays, etc. Power wiring and disconnect switches are included in the Electrical Specifications except that power wiring required for control devices such as thermostats, etc., is included in the control system.
   1. Provide access to hardware and software or onsite technical support required to assist the TAB effort. The hardware and software or the onsite technical support shall be provided at no cost to the TAB Firm.

B. Type of system: The control system shall be electric/electronic.

C. Contractor Qualifications: All controls shall be furnished and installed by a Contractor who is licensed, certified or contracted by the controls manufacturer for design, installation, start-up and service of their product. The Contractor must have factory supplied training and support. The Contractor must have sufficient personnel to respond to a trouble call at the site within two hours. The Contractor's local manager shall have a minimum of five years experience in the design, installation, start-up and service of similar systems. The Contractor shall submit a list of at least five projects which are similar in size, scope and contract value to this project. This list shall include the Owner's contact person, phone number and controls contract value.

D. Submittals: Submittals shall include the following:
   1. Contractor qualifications. Manufacturer licenses, contracts or certifications for the installer shall be submitted on manufacturer's letterhead.
   2. Manufacturer's data for all devices.
   3. Diagrams showing control schematics. Diagrams shall include all sensors, terminal strips, panels and control devices. Locations of all devices shall be indicated.
   4. Sequence of operation.

E. System Components:
   1. Thermostats: Reuse existing.
   2. Wall Switches: Plates for all wall switches and timers shall match those specified in Division 26.
   3. Labels: All labels, signs, etc. shall be engraved, laminated plastic, white on black background, 1/8" high lettering, minimum.
   4. Temperature Control Panels: Hinged, lockable front panel. Each panel and each control device or readout on the front of the panel shall be identified with an engraved plastic label with 1/4" high lettering, white on black background. Pilot lights shall be the push-to-test type.
   5. Time Clock: Single channel digital. 100 hr. battery backup. Grasslin.

F. System Shall Function as Follows:
   1. Heating/Cooling Unit: Reconnect to existing thermostat.
   2. Exhaust Fan: See equipment schedule on drawings.

G. Installation: All electrical work shall be in accordance with the California Electrical Code and the Electrical Specification Sections. All electric/electronic systems shall be hardwired in conduit. Wiring shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed wiring shall run parallel to room surfaces; location shall be approved by the Architect. No structural member shall be weakened by cutting, notching, boring or otherwise. Provide a 120-volt circuit for each device requiring external power. Dedicated circuits shall be provided where required. Any devices or wiring exposed to the weather shall be protected in weatherproof enclosures such as NEMA 3R and weatherproof conduit. Set, test and adjust the system for proper operation.

H. Programming: The Contractor shall be responsible for programming the system and shall coordinate the scheduling (on/off times) with the Owner.

**END OF SECTION 23 0001**

**SECTION 260519**
**ELECTRICAL POWER CONDUCTORS AND CABLES**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Single conductor building wire.

B. Underground feeder and branch-circuit cable.

C. Metal-clad cable.

D. Wiring connectors.

E. Electrical tape.

F. Heat shrink tubing.

G. Wire pulling lubricant.

H. Firestop sleeves.

1.2 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.

F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2020.

G. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

H. NECA 120 - Standard for Installing Armored Cable (AC) and Type Metal-Clad (MC) Cable; 2018.

I. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF); 2007.

J. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.

K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

M. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

N. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.

O. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

P. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

Q. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

R. UL 493 - Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables; Current Edition, Including All Revisions.

S. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

T. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2) Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

3) Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

C. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

1.5 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

**PART 2 PRODUCTS**

2.1 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Nonmetallic-sheathed cable is not permitted.

D. Metal-clad cable is permitted only as follows:

1) Where not otherwise restricted, may be used:

a) Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
Maximum Length: 6 feet (1.8 m).

2) In addition to other applicable restrictions, may not be used:

a) Where exposed to view.
b) Where exposed to damage.
c) For damp, wet, or corrosive locations, unless provided with a PVC jacket listed as suitable for those locations.

2.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:

1) Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.

2) Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.

3) Tinned Copper Conductors: Comply with ASTM B33.

H. Minimum Conductor Size:

1) Branch Circuits: 12 AWG.

a) Exceptions:
20 A, 120 V circuits longer than 75 feet (23 m): 10 AWG, for voltage drop.
20 A, 120 V circuits longer than 150 feet (46 m): 8 AWG, for voltage drop.

I. Conductor Color Coding:

1) Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.

2) Color Coding Method: Integrally colored insulation.

3) Color Code:

a) 208Y/120 V, 3 Phase, 4 Wire System:
Phase A: Black.
Phase B: Red.
Phase C: Blue.
Neutral/Grounded: White.
b) 240/120 V High-Leg Delta, 3 Phase, 4 Wire System:
Phase A: Black.
Phase B (High-Leg): Orange.
Phase C: Blue.
Neutral/Grounded: White.
c) 240/120 V, 1 Phase, 3 Wire System:
Phase A: Black.
Phase B: Red.
Neutral/Grounded: White.
d) Equipment Ground, All Systems: Green.

2.3 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:

1) Copper Building Wire:

a) Cerro Wire LLC: www.cerrowire.com/#sle.
b) Encore Wire Corporation: www.encorewire.com/#sle.
c) General Cable Technologies Corporation; _____: www.generalcable.com/#sle.
d) Service Wire Co: www.servicewire.com/#sle.
e) Southwire Company: www.southwire.com/#sle.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:

1) Feeders and Branch Circuits:

a) Size 10 AWG and Smaller: Solid.
b) Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:

1) Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.4 UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE

A. Description: NFPA 70, Type UF multiple-conductor cable listed and labeled as complying with UL 493, Type UF-B.

B. Provide equipment grounding conductor unless otherwise indicated.

C. Conductor Stranding:

1) Size 10 AWG and Smaller: Solid.

2) Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

2.5 METAL-CLAD CABLE

A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:

1) Size 10 AWG and Smaller: Solid.

2) Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

E. Grounding: Full-size integral equipment grounding conductor.

F. Armor: Steel, interlocked tape.

G. Provide PVC jacket applied over cable armor.

2.6 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Wiring Connectors for Splices and Taps:

1) Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.

2) Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

C. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F (105 degrees C) for standard applications and 302 degrees F (150 degrees C) for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.

D. Mechanical Connectors: Provide bolted type or set-screw type.

E. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.7 ACCESSORIES

A. Electrical Tape:

1) Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

2) Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

3) Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil (0.76 mm); suitable for continuous temperature environment up to 194 degrees F (90 degrees C) and short-term 266 degrees F (130 degrees C) overload service.

4) Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil (3.2 mm); suitable for continuous temperature environment up to 176 degrees F (80 degrees C).

5) Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil (2.3 mm).

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.

C. Wire Pulling Lubricant:

1) Listed and labeled as complying with UL 267.

2) Suitable for use with conductors/cables and associated insulation/jackets to be installed.

3) Suitable for use at installation temperature.

D. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

A. Circuiting Requirements:

1) Unless dimensioned, circuit routing indicated is diagrammatic.

2) When circuit destination is indicated without specific routing, determine exact routing required.

3) Arrange circuiting to minimize splices.

4) Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.

5) Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is permitted, under the following conditions:

a) Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
b) Increase size of conductors as required to account for ampacity derating.
c) Size raceways, boxes, etc. to accommodate conductors.

6) Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.

E. Install metal-clad cable (Type MC) in accordance with NECA 120.

F. Installation in Raceway:

1) Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.

2) Pull all conductors and cables together into raceway at same time.

3) Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.

4) Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

G. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

H. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

1) Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

I. Terminate cables using suitable fittings.

1) Metal-Clad Cable (Type MC):

a) Use listed fittings.
b) Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

J. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

K. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

L. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

M. Make wiring connections using specified wiring connectors.

1) Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.

2) Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.

3) Do not remove conductor strands to facilitate insertion into connector.

4) Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

5) Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

6) Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

N. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

1) Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

   a) For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.

2) Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

   a) For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
   b) For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

3) Wet Locations: Use heat shrink tubing or resin style splice kit.

O. Insulate ends of spare conductors using vinyl insulating electrical tape.

P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

Q. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

**END OF SECTION**

**SECTION 260526**
**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

D. Ground bars.

E. Ground rod electrodes.

F. Ground access wells.

1.2 RELATED REQUIREMENTS

A. Section 260519 - Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.

D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Verify exact locations of underground metal water service pipe entrances to building.

2) Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1) Do not install ground rod electrodes until final backfill and compaction is complete.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

C. Project Record Documents: Record actual locations of grounding electrode system components and connections.

**PART 2 PRODUCTS**

2.1 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by NFPA 70 and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Grounding System Resistance:

1) Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.

2) Grounding Electrode System: Not greater than 25 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.

F. Grounding Electrode System:

1) Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.

a) Provide continuous grounding electrode conductors without splice or joint.
b) Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.

2) Metal Underground Water Pipe(s):

a) Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.
b) Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
c) Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.

3) Ground Rod Electrode(s):

a) Provide two electrodes unless otherwise indicated or required.

b) Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.

c) Where location is not indicated, locate electrode(s) at least 5 feet (1.5 m) outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.

d) Provide ground access well for each electrode.

4) Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.

G. Grounding for Separate Building or Structure Supplied by Feeder(s) or Branch Circuits:

1) Provide grounding electrode system for each separate building or structure.

2) Provide equipment grounding conductor routed with supply conductors.

3) For each disconnecting means, provide grounding electrode conductor to connect equipment ground bus to grounding electrode system.

4) Do not make any connections and remove any factory-installed jumpers between neutral (grounded) conductors and ground.

H. Separately Derived System Grounding:

1) Separately derived systems include, but are not limited to:

a) Transformers (except autotransformers such as buck-boost transformers).

b) Uninterruptible power supplies (UPS), when configured as separately derived systems.

2) Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.

3) Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.

4) Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.

5) Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

I. Bonding and Equipment Grounding:

1) Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2) Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.

3) Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.

4) Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5) Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.

6) Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

7) Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:

a) Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
b) Metal gas piping.

8) Provide bonding for metal building frame.

J. Communications Systems Grounding and Bonding:

1) Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.

a) Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
b) Raceway Size: 3/4 inch (21 mm) trade size unless otherwise indicated or required.
c) Ground Bar Size: 1/4 by 2 by 12 inches (6 by 50 by 300 mm) unless otherwise indicated or required.
d) Ground Bar Mounting Height: 18 inches (450 mm) above finished floor unless otherwise indicated.

2.2 GROUNDING AND BONDING COMPONENTS

A. General Requirements:

1) Provide products listed, classified, and labeled as suitable for the purpose intended.

2) Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:

1) Use insulated copper conductors unless otherwise indicated.

a) Exceptions:
Use bare copper conductors where installed underground in direct contact with earth.
Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:

1) Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.

2) Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.

3) Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Bars:

1) Description: Copper rectangular ground bars with mounting brackets and insulators.

2) Size: As indicated.

3) Holes for Connections: As indicated or as required for connections to be made.

E. Ground Rod Electrodes:

1) Comply with NEMA GR 1.

2) Material: Copper-bonded (copper-clad) steel.

3) Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.

F. Ground Access Wells:

1) Description: Open bottom round or rectangular well with access cover for testing and inspection; suitable for the expected load at the installed location.

2) Size: As required to provide adequate access for testing and inspection, but not less than minimum size requirements specified.

a) Round Wells: Not less than 8 inches (200 mm) in diameter.

3) Depth: As required to extend below frost line to prevent frost upheaval, but not less than 10 inches (250 mm).

4) Cover: Factory-identified by permanent means with word "GROUND".

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as indicated.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.

1) Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches (150 mm) below finished grade.

2) Indoor Installations: Unless otherwise indicated, install with 4 inches (100 mm) of top of rod exposed.

D. Make grounding and bonding connections using specified connectors.

1) Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.

2) Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.

3) Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.

4) Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

5) Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

E. Identify grounding and bonding system components in accordance with Section 260553.

**END OF SECTION**

**SECTION 260529**
**HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.2 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.

1.3 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

D. MFMA-4 - Metal Framing Standards Publication; 2004.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.

2) Coordinate work to provide additional framing and materials required for installation.

3) Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.

4) Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.

5) Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1) Do not install products on or provide attachment to concrete surfaces until concrete has cured; see Section 033000.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems, nonpenetrating rooftop supports, and post-installed concrete/masonry anchors.

C. Evaluation Reports: For products specified as requiring evaluation and recognition by ICC Evaluation Service, LLC (ICC-ES), provide current ICC-ES evaluation reports upon request.

**PART 2 PRODUCTS**

2.1 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:

1) Comply with the following. Where requirements differ, comply with most stringent.

a) NFPA 70.
b) Requirements of authorities having jurisdiction.

2) Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.

3) Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.

4) Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.

5) Do not use products for applications other than as permitted by NFPA 70 and product listing.

6) Steel Components: Use corrosion-resistant materials suitable for environment where installed.

a) Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
b) Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
c) Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
d) Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.

1) Conduit Straps: One-hole or two-hole type; steel or malleable iron.

2) Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.

D. Metal Channel/Strut Framing Systems:

1) Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.

2) Comply with MFMA-4.

E. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:

1) Manufacturers - Mechanical Anchors:

a) Dewalt: anchors.dewalt.com/#sle.
b) Hilti, Inc: www.hilti.com/#sle.
c) ITW Red Head, a division of Illinois Tool Works, Inc: www.itwredhead.com/#sle.
d) Simpson Strong-Tie Company Inc: www.strongtie.com/#sle.

2) Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.

3) Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.

4) Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.

5) Hollow Masonry: Use toggle bolts.

6) Steel: Use beam clamps, machine bolts, or welded threaded studs.

7) Wood: Use wood screws.

8) Plastic and lead anchors are not permitted.

9) Preset Concrete Inserts: Continuous metal channel/strut and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.

a) Manufacturer: Same as manufacturer of metal channel/strut framing system.
b) Comply with MFMA-4.
c) Channel Material: Use galvanized steel.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install hangers and supports in accordance with NECA 1.

C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.

D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.

F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

H. Equipment Support and Attachment:

1) Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.

2) Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.

3) Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.

4) Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

I. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.

J. Secure fasteners in accordance with manufacturer's recommended torque settings.

K. Remove temporary supports.

**END OF SECTION**

**SECTION 260533.13**
**CONDUIT FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Galvanized steel intermediate metal conduit (IMC).

C. Flexible metal conduit (FMC).

D. Liquidtight flexible metal conduit (LFMC).

E. Galvanized steel electrical metallic tubing (EMT).

F. Aluminum electrical metallic tubing (EMT).

G. Rigid polyvinyl chloride (PVC) conduit.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

1.3 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.

C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit; 2018.

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.

F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.

G. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

H. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.

I. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.

J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

L. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

M. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.

N. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

O. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

P. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

Q. UL 797A - Electrical Metallic Tubing - Aluminum and Stainless Steel; Current Edition, Including All Revisions.

R. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

S. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2) Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.

3) Verify exact conduit termination locations required for boxes, enclosures, and equipment.

4) Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.

5) Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1) Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

**PART 2 PRODUCTS**

2.1 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most

restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:

1) Exterior, Direct-Buried: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), or rigid PVC conduit.

2) Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), or rigid PVC conduit.

3) Where rigid polyvinyl chloride (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) or galvanized steel intermediate metal conduit (IMC) where emerging from underground at exposed/unprotected locations.

4) Where galvanized steel rigid metal conduit (RMC) or galvanized steel intermediate metal conduit (IMC) is installed in direct contact with earth, use corrosion protection tape, factory-applied corrosion protection coating, or field-applied corrosion protection compound acceptable to authorities having jurisdiction to provide supplementary corrosion protection.

D. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit (RMC) or galvanized steel intermediate metal conduit (IMC).

E. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), or galvanized steel electrical metallic tubing (EMT).

F. Concealed Above Accessible Ceilings: Use galvanized steel electrical metallic tubing (EMT) or aluminum electrical metallic tubing (EMT).

G. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), galvanized steel electrical metallic tubing (EMT), or aluminum electrical metallic tubing (EMT).

H. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit (RMC) or galvanized steel intermediate metal conduit (IMC).

I. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), or galvanized steel electrical metallic tubing (EMT).

J. Flexible Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit (FMC) or or Type MC Cable.

1) Maximum Length: 6 feet (1.8 m).

K. Flexible Connections to Vibrating Equipment:

1) Dry Locations: Use flexible metal conduit (FMC).

2) Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).

3) Maximum Length: 6 feet (1.8 m) unless otherwise indicated.

4) Vibrating equipment includes, but is not limited to:

a) Transformers.
b) Motors.

L. Fished in Existing Walls, Where Necessary: Use flexible metal conduit (FMC), galvanized steel electrical metallic tubing (EMT), or aluminum electrical metallic tubing (EMT).

2.2 CONDUIT - GENERAL REQUIREMENTS

A. Comply with NFPA 70.

B. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling mandrel through them.

1) Where permitted, existing conduits to be reused may be used as sole equipment grounding conductor only when continuity of conduit pathway, including associated boxes and fittings, is verified.

C. Provide conduit, fittings, supports, and accessories required for complete raceway system.

D. Provide products listed, classified, and labeled as suitable for purpose intended.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:

1) Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.

2) Material: Use steel or malleable iron.

3) Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.4 GALVANIZED STEEL INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:

1) Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 1242.

2) Material: Use steel or malleable iron.

3) Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.5 FLEXIBLE METAL CONDUIT (FMC)

A. Description: NFPA 70, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.

B. Fittings:

1) Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2) Material: Use steel or malleable iron.

2.6 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings:

1) Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2) Material: Use steel or malleable iron.

2.7 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:

1) Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2) Material: Use steel or malleable iron.

3) Connectors and Couplings: Use compression/gland or set-screw type.

a) Do not use indenter type connectors and couplings.

2.8 ALUMINUM ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT aluminum electrical metallic tubing listed and labeled as complying with UL 797A.

B. Fittings:

1) Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; listed for use with aluminum EMT.

2) Material: Use aluminum.

3) Connectors and Couplings: Use compression/gland or set-screw type.

a) Do not use indenter type connectors and couplings.

4) Damp or Wet Locations, Where Permitted: Use fittings listed for use in wet locations.

2.9 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:

1) Manufacturer: Same as manufacturer of conduit to be connected.

2) Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.10 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil, 0.020 inch (0.51 mm).

B. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.

C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

D. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf (5.6 kN).

E. Foam Conduit Sealant:

1) Removable, two-part, closed-cell foam, specifically designed for sealing conduit openings against water, moisture, gases, and dust.

2) Suitable for use with conductors/cables and associated insulation/jackets to be installed.

3) Rated to hold minimum of 10 ft (3.0 m) water head pressure.

F. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive conduits.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install conduit in accordance with NECA 1.

C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.

D. Intermediate Metal Conduit (IMC): Install in accordance with NECA 101.

E. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.

F. Conduit Routing:

1) Unless dimensioned, conduit routing indicated is diagrammatic.

2) When conduit destination is indicated without specific routing, determine exact routing required.

3) Conceal conduits unless specifically indicated to be exposed.

4) Conduits in the following areas may be exposed, unless otherwise indicated:

a) Electrical rooms.
b) Mechanical equipment rooms.
c) Within joists in areas with no ceiling.

5) Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.

6) Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.

7) Arrange conduit to provide no more than 150 feet (46 m) between pull points.

G. Conduit Support:

1) Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 260529.

2) Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

3) Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.

4) Use conduit strap to support single surface-mounted conduit.

a) Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.

5) Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.

6) Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to support multiple parallel suspended conduits.

7) Use of spring steel conduit clips for support of conduits is not permitted.

8) Use of wire for support of conduits is not permitted.

H. Connections and Terminations:

1) Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.

2) Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.

3) Use suitable adapters where required to transition from one type of conduit to another.

4) Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.

5) Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.

6) Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.

7) Secure joints and connections to provide mechanical strength and electrical continuity.

I. Penetrations:

1) Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.

2) Make penetrations perpendicular to surfaces unless otherwise indicated.

3) Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.

4) Conceal bends for conduit risers emerging above ground.

5) Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

6) Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.

7) Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078400.

J. Underground Installation:

1) Provide trenching and backfilling; see Section 312316 and Section 312323.

2) Minimum Cover, Unless Otherwise Indicated or Required:

a) Underground, Exterior: 24 inches (610 mm).

3) Provide underground warning tape along entire conduit length;.

K. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:

1) Where conduits cross structural joints intended for expansion, contraction, or deflection.

2) Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.

3) Where conduits are subject to earth movement by settlement or frost.

L. Conduit Sealing:

1) Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:

a) Where conduits enter building from outside.
b) Where service conduits enter building from underground distribution system.
c) Where conduits enter building from underground.
d) Where conduits may transport moisture to contact live parts.

2) Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:

a) Where conduits pass from outdoors into conditioned interior spaces.
b) Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

M. Provide grounding and bonding; see Section 260526.

**END OF SECTION**

**SECTION 260533.16**
**BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).

C. Boxes and enclosures for integrated power, data, and audio/video.

D. Underground boxes/enclosures.

1.2 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.

B. Section 262726 - Wiring Devices:

1) Wall plates.

1.3 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. SCTE 77 - Specifications for Underground Enclosure Integrity; 2023.

H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

J. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.

2) Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3) Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.

4) Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.

5) Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.

6) Coordinate the work with other trades to preserve insulation integrity.

7) Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.

8) Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1) See Section 016000 - Product Requirements, for additional provisions.

2) Keys for Lockable Enclosures: Two of each different key.

**PART 2 PRODUCTS**

2.1 BOXES

A. General Requirements:

1) Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.

2) Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.

3) Provide products listed, classified, and labeled as suitable for the purpose intended.

4) Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

5) Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:

1) Use sheet-steel boxes for dry locations unless otherwise indicated or required.

2) Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.

3) Use suitable concrete type boxes where flush-mounted in concrete.

4) Use suitable masonry type boxes where flush-mounted in masonry walls.

5) Use raised covers suitable for the type of wall construction and device configuration where required.

6) Use shallow boxes where required by the type of wall construction.

7) Do not use "through-wall" boxes designed for access from both sides of wall.

8) Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.

9) Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.

10) Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.

11) Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.

12) Wall Plates: Comply with Section 262726.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):

1) Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.

2) NEMA 250 Environment Type, Unless Otherwise Indicated:

3) Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):

a) Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

4) Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:

a) Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.

5) Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.

D. Boxes and Enclosures for Integrated Power, Data, and Audio/Video: Size and configuration as indicated or as required with partitions to separate services; field-connected gangable boxes may be used.

E. Underground Boxes/Enclosures:

1) Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.

2) Size: As indicated on drawings.

3) Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches (300 mm).

4) Applications:

a) Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.

5) Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.

a) Manufacturers:
Hubbell Incorporated; Quazite Products;
_____: www.hubbellpowersystems.com/#sle.
Oldcastle Precast, Inc; _____: www.oldcastleprecast.com/#sle.

b) Combination fiberglass/polymer concrete boxes/enclosures are not acceptable. Use all-polymer concrete boxes/enclosures.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive boxes.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Box Locations:

1) Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.

2) Unless dimensioned, box locations indicated are approximate.

3) Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.

4) Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches (150 mm) horizontal separation unless otherwise indicated.

5) Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.

a) Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.

6) Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:

a) Concealed above accessible suspended ceilings.
b) Within joists in areas with no ceiling.
c) Electrical rooms.
d) Mechanical equipment rooms.

E. Box Supports:

1) Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.

2) Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

F. Install boxes plumb and level.

G. Flush-Mounted Boxes:

1) Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface.

2) Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.

3) Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch (3 mm) at the edge of the box.

H. Install boxes as required to preserve insulation integrity.

I. Underground Boxes/Enclosures:

1) Install enclosure on gravel base, minimum 6 inches (150 mm) deep.

2) Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

J. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

K. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

L. Close unused box openings.

M. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

N. Provide grounding and bonding in accordance with Section 260526.

**END OF SECTION**

**SECTION 260533.23**
**SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Surface raceway systems.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

C. Section 260533.13 - Conduit for Electrical Systems.

D. Section 260533.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 5 - Surface Metal Raceways and Fittings; Current Edition, Including All Revisions.

D. UL 5A - Nonmetallic Surface Raceways and Fittings; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate the placement of raceways with millwork, furniture, equipment, etc. installed under other sections or by others.

2) Coordinate rough-in locations of outlet boxes provided under Section 260533.16 and conduit provided under Section 260533.13 as required for installation of raceways provided under this section.

3) Verify minimum sizes of raceways with the actual conductors and components to be installed.

4) Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1) Do not install raceways until final surface finishes and painting are complete.

2) Do not begin installation of conductors and cables until installation of raceways is complete between outlet, junction and splicing points.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including dimensions, knockout sizes and locations, materials, fabrication details, finishes, service condition requirements, and accessories.

1) Surface Raceway Systems: Include information on fill capacities for conductors and cables.

**PART 2 PRODUCTS**

2.1 RACEWAY REQUIREMENTS

A. Provide all components, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Do not use raceways for applications other than as permitted by NFPA 70 and product listing.

2.2 SURFACE RACEWAY SYSTEMS

A. Manufacturers:

1) Hubbell Incorporated; _____: www.hubbell.com/#sle.

2) Legrand North America, Inc; _____: www.legrand.us/#sle.

3) Or approved equal.

B. Surface Metal Raceways: Listed and labeled as complying with UL 5.

C. Surface Nonmetallic Raceways: Listed and labeled as complying with UL 5A.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes and conduit terminations are installed in proper locations and are properly sized in accordance with NFPA 70 to accommodate raceways.

C. Verify that mounting surfaces are ready to receive raceways and that final surface finishes are complete, including painting.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install raceways plumb and level.

D. Secure and support raceways in accordance with Section 260529 at intervals complying with NFPA 70 and manufacturer's requirements.

E. Close unused raceway openings.

F. Provide grounding and bonding in accordance with Section 260526.

**END OF SECTION**

**SECTION 262200**
**LOW-VOLTAGE TRANSFORMERS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. General purpose transformers.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

C. Section 260533.13 - Conduit for Electrical Systems: Flexible conduit connections.

1.3 REFERENCE STANDARDS

A. 10 CFR 431, Subpart K - Energy Efficiency Program for Certain Commercial and Industrial Equipment - Distribution Transformers; Current Edition.

B. IEEE C57.94 - IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type Distribution and Power Transformers; 2015.

C. IEEE C57.96 - IEEE Standard Guide for Loading Dry-Type Distribution and Power Transformers; 2013.

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

E. NECA 409 - Standard for Installing and Maintaining Dry-Type Transformers; 2015.

F. NEMA ST 20 - Dry Type Transformers for General Applications; 2021.

G. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 506 - Standard for Specialty Transformers; Current Edition, Including All Revisions.

J. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.

2) Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3) Coordinate the work with placement of supports, anchors, etc. required for mounting.

4) Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.

5) Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated temperature rise, efficiency, sound level, enclosure ratings, outline and support point dimensions, weight, required clearances, service condition requirements, and installed features.

C. Maintenance Data: Include recommended maintenance procedures and intervals.

D. Project Record Documents: Record actual locations of transformers.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. ABB: www.electrification.us.abb.com/#sle.

B. Eaton Corporation: www.eaton.com/#sle.

C. Schneider Electric: www.se.com/#sle.

D. Siemens Industry, Inc: www.new.siemens.com/#sle.

E. Or approved equal..

2.2 TRANSFORMERS - GENERAL REQUIREMENTS

A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for the purpose intended.

B. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:

1) Altitude: Less than 3,300 feet (1,000 m).

2) Ambient Temperature:

a) Greater than 10 kVA: Not exceeding 113 degrees F (45 degrees C).
b) Less than 10 kVA: Not exceeding 77 degrees F (25 degrees C).

C. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent pressure throughout core length.

D. Impregnate core and coil assembly with non-hydroscopic thermo-setting varnish to effectively seal out moisture and other contaminants.

E. Basic Impulse Level: 10 kV.

F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

G. Isolate core and coil from enclosure using vibration-absorbing mounts.

H. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

2.3 GENERAL PURPOSE TRANSFORMERS

A. Description: Self-cooled, transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.

B. Insulation System and Allowable Average Winding Temperature Rise:

1) Less than 15 kVA: Class 180 degrees C insulation system with 115 degrees C average winding temperature rise.

2) 15 kVA and Larger: Class 220 degrees C insulation system with 115 degrees C average winding temperature rise.

C. Coil Conductors: Continuous aluminum windings with terminations brazed or welded.

D. Winding Taps:

1) Less than 3 kVA: None.

2) 3 kVA through 15 kVA: None.

3) 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.

4) 500 kVA and Larger: Two 2.5 percent full capacity primary taps above and two 2.5 percent full capacity primary taps below rated voltage.

E. Energy Efficiency: Comply with 10 CFR 431, Subpart K.

F. Sound Levels: Standard sound levels complying with NEMA ST 20

G. Mounting Provisions:

1) Less than 15 kVA: Suitable for wall mounting.

2) 15 kVA through 75 kVA: Suitable for wall, floor, or trapeze mounting.

3) Larger than 75 kVA: Suitable for floor mounting.

H. Transformer Enclosure: Comply with NEMA ST 20.

1) Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:

a) Indoor clean, dry locations: Type 2.
b) Outdoor locations: Type 3R.

2) Construction: Steel.

a) Less than 15 kVA: Totally enclosed, non-ventilated.
b) 15 kVA and Larger: Ventilated.

3) Finish: Manufacturer's standard grey, suitable for outdoor installations.

4) Provide lifting eyes or brackets.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that suitable support frames and anchors are installed where required and that mounting surfaces are ready to receive transformers.

C. Perform pre-installation tests and inspections on transformers per manufacturer's instructions and as specified in NECA 409. Correct deficiencies prior to installation.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Install transformers in accordance with NECA 409 and IEEE C57.94.

D. Use flexible conduit, under the provisions of Section 260533.13, 2 feet (600 mm) minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

E. Arrange equipment to provide minimum clearances as specified on transformer nameplate and in accordance with manufacturer's instructions and NFPA 70.

F. Install transformers plumb and level.

G. Transformer Support:

1) Provide required support and attachment in accordance with Section 260529, where not furnished by transformer manufacturer.

2) Use integral transformer flanges, accessory brackets furnished by manufacturer, or field-fabricated supports to support wall-mounted transformers.

3) Unless otherwise indicated, mount floor-mounted transformers on properly sized 3 inch (80 mm) high concrete pad constructed in accordance with Section 033000.

4) Use trapeze hangers assembled from threaded rods and metal channel (strut) to support suspended transformers. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

H. Provide grounding and bonding in accordance with Section 260526.

I. Remove shipping braces and adjust bolts that attach the core and coil mounting bracket to the enclosure according to manufacturer's recommendations in order to reduce audible noise transmission.

J. Where not factory-installed, install lugs sized as required for termination of conductors as indicated.

**END OF SECTION**

**SECTION 262416**
**PANELBOARDS**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Power distribution panelboards.

B. Lighting and appliance panelboards.

C. Overcurrent protective devices for panelboards.

1.2 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260529 - Hangers and Supports for Electrical Systems.

1.3 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e, with Amendments (2022).

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2015.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

E. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013.

F. NEMA PB 1 - Panelboards; 2011.

G. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 1000V or Less; 2023.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

K. UL 67 - Panelboards; Current Edition, Including All Revisions.

L. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

M. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.

2) Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3) Coordinate the work with other trades to provide walls suitable for installation of flush-mounted panelboards where indicated.

4) Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.

5) Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

D. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.

E. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.6 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

A. ABB: www.electrification.us.abb.com/#sle.

B. Eaton Corporation: www.eaton.com/#sle.

C. Schneider Electric: www.se.com/#sle.

D. Siemens Industry, Inc: www.new.siemens.com/#sle.

2.2 PANELBOARDS - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:

1) Altitude: Less than 6,600 feet (2,000 m).

2) Ambient Temperature:

a) Panelboards Containing Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).

C. Short Circuit Current Rating:

1) Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.

D. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.

E. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.

F. Bussing: Sized in accordance with UL 67 temperature rise requirements.

1) Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.

G. Conductor Terminations: Suitable for use with the conductors to be installed.

H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.

1) Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:

a) Indoor Clean, Dry Locations: Type 1.
b) Outdoor Locations: Type 3R.

2) Boxes: Galvanized steel unless otherwise indicated.

a) Provide wiring gutters sized to accommodate the conductors to be installed.
b) Increase gutter space as required where sub-feed lugs, feed-through lugs, gutter taps, or oversized lugs are provided.

3) Fronts:

a) Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
b) Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
c) Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.

4) Lockable Doors: All locks keyed alike unless otherwise indicated.

I. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

J. Provide the following features and accessories where indicated or where required to complete installation:

1) Feed-through lugs.

2) Sub-feed lugs.

2.3 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:

1) Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

2) Main and Neutral Lug Type: Mechanical.

C. Bussing:

1) Phase and Neutral Bus Material: Aluminum.

2) Ground Bus Material: Aluminum.

D. Circuit Breakers:

1) Provide bolt-on type.

2) Provide thermal magnetic circuit breakers unless otherwise indicated.

3) Provide electronic trip circuit breakers for circuit breaker frame sizes _____ amperes and above.

E. Enclosures:

1) Provide surface-mounted enclosures unless otherwise indicated.

2.4 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:

1) Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

2) Main and Neutral Lug Type: Mechanical.

C. Bussing:

1) Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.

2) Phase and Neutral Bus Material: Aluminum.

3) Ground Bus Material: Aluminum.

D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.

E. Enclosures:

1) Provide surface-mounted or flush-mounted enclosures as indicated.

2) Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring gutters, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.

3) Provide clear plastic circuit directory holder mounted on inside of door.

2.5 OVERCURRENT PROTECTIVE DEVICES

A. Fusible Switches:

1) Description: Quick-make, quick-break, dead-front fusible switch units complying with NEMA KS 1, and listed and labeled as complying with UL 98; ratings, configurations, and features as indicated on the drawings.

2) Fuse Clips: As required to accept indicated fuses.

3) Provide externally operable handle with means for locking in the OFF position. Provide means for locking switch cover in the closed position. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

B. Molded Case Circuit Breakers:

1) Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

2) Interrupting Capacity:

a) Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:

b) Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.

3) Conductor Terminations:

a) Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

4) Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.

5) Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive panelboards.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.

D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

E. Provide required support and attachment in accordance with Section 260529.

F. Install panelboards plumb.

G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.

H. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches (2000 mm) above the floor or working platform.

I. Mount floor-mounted power distribution panelboards on properly sized (indoors 3" high, outdoors 6" pad) concrete pad constructed as indic.

J. Provide minimum of four spare 1 inch (27 mm) trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling.

K. Provide grounding and bonding in accordance with Section 260526.

L. Install all field-installed branch devices, components, and accessories.

M. Provide fuses complying with Section 262813 for fusible switches as indicated.

N. Provide filler plates to cover unused spaces in panelboards.

3.3 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of panelboard fronts.

**END OF SECTION**

**SECTION 262726**
**WIRING DEVICES**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Wall plates and covers.

1.2 RELATED REQUIREMENTS

A. Section 260533.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2014h (Validated 2022).

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush Mounted (General Specification); 2017g (Validated 2023).

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).

F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.

2) Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.

3) Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.

4) Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Operation and Maintenance Data:

1) GFCI Receptacles: Include information on status indicators.

1.6 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Listed, classified, and labeled as suitable for the purpose intended.

**PART 2 PRODUCTS**

2.1 WIRING DEVICES - GENERAL REQUIREMENTS

A. Provide wiring devices suitable for intended use with ratings adequate for load served.

B. Wiring Device Applications:

1) Receptacles Installed Outdoors or in Damp or Wet Locations: Use weather-resistant GFCI receptacles with weatherproof covers.

2) Receptacles Installed in Classroom and Student Occupied Spaces: Use tamper-resistant receptacles.

3) Provide GFCI protection for:

a) Receptacles installed within 6 feet (1.8 m) of sinks.
b) Receptacles serving electric drinking fountains.

C. Wiring Device Finishes:

1) Provide wiring device finishes as described below, unless otherwise indicated.

2) Wiring Devices, Unless Otherwise Indicated: White with white stainless steel wall plate.

2.2 WALL SWITCHES

A. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1) Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.3 RECEPTACLES

A. Manufacturers:

1) Hubbell Incorporated; _____: www.hubbell.com/#sle.

2) Leviton Manufacturing Company, Inc; _____: www.leviton.com/#sle.

3) Lutron Electronics Company, Inc; Designer Style: www.lutron.com/#sle.

4) Pass & Seymour, a brand of Legrand North America, Inc; _____: www.legrand.us/#sle.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

1) Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.

2) NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:

1) Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.

2) Automatically Controlled Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; controlled receptacle marking on device face per NFPA 70; single or duplex as indicated on the drawings.

3) Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.

4) Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.

D. GFCI Receptacles:

1) GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.

2) Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations.

3) Tamper Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.

2.4 WALL PLATES AND COVERS

A. Wall Plates: Comply with UL 514D.

1) Configuration: One piece cover as required for quantity and types of corresponding wiring devices.

2) Size: Standard.

3) Screws: Metal with slotted heads finished to match wall plate finish.

B. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

C. Weatherproof Receptacle Covers for Wet Locations: Gasketed, cast aluminum or galvanized steel, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

F. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.

1) Mounting Heights: Unless otherwise indicated, as follows:

a) Wall Switches: 48 inches (1200 mm) above finished floor to top of box.
b) Receptacles: 18 inches (450 mm) above finished floor or 6 inches (150 mm) above counter.

2) Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.

3) Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches (150 mm) long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

I. Install wiring devices plumb and level with mounting yoke held rigidly in place.

J. Install wall switches with OFF position down.

K. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

## 3.4 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**END OF SECTION**

**SECTION 265100**
**INTERIOR LIGHTING**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Interior luminaires.

B. Emergency lighting units.

C. Exit signs.

1.2 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.

B. Section 260533.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

A. NECA/IESNA 500 - Standard for Installing Indoor Lighting Systems; 2006.

B. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

F. UL 1598 - Luminaires; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.

2) Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.

3) Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.

4) Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

D. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

E. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

1.6 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide 5-year manufacturer warranty for LED luminaires, including drivers.

C. Provide 5-year pro-rata warranty for batteries for emergency lighting units.

**PART 2 PRODUCTS**

2.1 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: See Section 016000 - Product Requirements.

2.2 LUMINAIRES

A. Manufacturers:

1) Acuity Brands, Inc: www.acuitybrands.com/#sle.

2) Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.

3) Hubbell Lighting, Inc; _____: www.hubbelllighting.com/#sle.

4) Lutron Electronics Company, Inc; _____: www.lutron.com/#sle.

5) RAB Lighting, Inc; _____: www.rablighting.com/#sle.

6) Or approved equal.

B. Provide products that comply with requirements of NFPA 70.

C. Provide products that are listed and labeled as complying with UL 1598, where applicable.

D. Provide products listed, classified, and labeled as suitable for the purpose intended.

E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

2.3 EMERGENCY LIGHTING UNITS

A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

C. Battery:

1) Size battery to supply all connected lamps, including emergency remote heads where indicated for operation of minimum of 90 minutes.

D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.

E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.4 EXIT SIGNS

A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as complying with UL 924.

1) Number of Faces: Single- or double-face as indicated or as required for installed location.

2) Directional Arrows: As indicated or as required for installed location.

B. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.

B. Install products in accordance with manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).

D. Provide required support and attachment in accordance with Section 260529.

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Suspended Ceiling Mounted Luminaires:

1) Do not use ceiling tiles to bear weight of luminaires.

2) Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.

3) Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.

4) See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

G. Recessed Luminaires:

1) Install trims tight to mounting surface with no visible light leakage.

H. Suspended Luminaires:

1) Unless otherwise indicated, specified mounting heights are to bottom of luminaire.

2) Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.

I. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to bottom of luminaire.

J. Install accessories furnished with each luminaire.

K. Bond products and metal accessories to branch circuit equipment grounding conductor.

L. Emergency Lighting Units:

M. Exit Signs:

N. Install lamps in each luminaire.

3.4 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect or authority having jurisdiction.

C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

3.5 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

**END OF SECTION**

# 27 02 00 General Requirements (Structured Cabling Systems and Pathways and Spaces systems for all Voice and Data systems)

## 27 02 01 Summary

A. The Scope of Work covered by this document is to furnish and install the Structured Cabling Systems and Pathways and Spaces systems. This work will provide for the structured cabling system (SCS) for all Voice and Data systems.

B. Telecommunications system shall include the following systems:

1. Structured Cabling System (SCS) For Telecommunications Systems
2. Pathways for Telecommunications Systems
3. Grounding and Bonding System (GBS) For Telecommunications Systems
4. Fire stopping for Telecommunications Systems

## 27 02 05 Additional Requirements

A. **Coordination of work:** Contractor shall be responsible for coordination of work among project specification divisions and contractor/subcontractors involved in this project. This coordination of Work Includes following instructions provided the Construction Manager or General Contractor if project is managed by such.

B. **General compliance requirements:** Provide a complete and operable system in compliance with project drawings, specifications, referenced standards, applicable building codes, and Authority Having Jurisdiction (AHJ) requirements. Scope of this contract includes materials, equipment, labor, configuration, programming, testing, startup and commissioning services, and documentation costs for complete and operable system that meets all requirements indicated on drawings or contained in specifications. Comply with all contract documents, specifications, drawings, manufacturer's instructions, and Owner and AHJ requirements. In case of conflict among applicable documents or standards, contractor shall notify owner's representative in writing of apparent conflict and then comply with most stringent requirements unless otherwise directed in writing from owner's representative. Work includes all items required for the complete system whether or not identified in specification or drawings.

C. Information about general construction and architectural features and finishes shall be derived from structural and architectural drawings and specifications only.

D. Work related to telecommunications system shall be installed by an SCS manufacturers authorized or certified trained installer. Owner reserves the right to review and approves any personnel assigned to this project in a supervisory or managerial role.

E. SCS contractor shall have had at least 3 years of comparable experience with telecommunications projects. Comparable projects shall equal or exceed size and complexity of work on drawings.

F. **Complete and usable work:** Refer to and comply with requirements in section 27 02 67 outlined below.

## 27 02 10 Related Documents and Drawings

A. **General:** The project drawings and general conditions of Contract shall apply to this section.

B. **Coordination:** Coordinate with work specified in other sections and divisions of specifications.

C. **Reference:** Codes and standards as referenced in Section 27 02 20 may define additional specifications or requirements not specifically called out within this division. However, contractor shall adhere to most stringent requirements as defined herein, or as defined by reference within section 27 02 20.

D. Architectural and Engineering specifications may have additional conditions or requirements that affect the work defined by this division of specifications. Contractor shall be responsible for the coordination of all conditions and other trade requirements that may impact schedule, scope of work, work progress, or other factors that may affect the overall ability for contractor to execute the requirements of this division of specifications.

## 27 02 20 Codes and Standards

A. General: All work, including but not limited to: cabling, pathways, support structures, wiring, equipment, installation and workmanship shall comply with the latest editions of the requirements of the Authority Having Jurisdiction (AHJ), California Electrical Code, all applicable local rules and regulations, equipment manufacturer's instructions, and the National Electrical Contractor's Association (NECA) Standard of Installation. In case of discrepancy or disagreement between the documents noted above, the Contractor shall satisfy the most stringent requirements.

B. Other sections of this document contain References to Codes and Standards that are applicable to the section.

## 27 02 20.20 Codes

A. California Electric Code (CEC)

B. National Fire Protection Association (NFPA)

NFPA 70, National Electrical Code (NEC)

NFPA 72, National Fire Alarm Code

NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment

NFPA 76, Recommended Practice for the Fire Protection of Telecommunications Facilities

NFPA 101, Life Safety Code

## 27 02 20.40 Reference Standards

A. Telecommunications Industry Association (TIA)

TIA-526-7, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant – OFSTP-7

T-526-14-A, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant – SFSTP-14

TIA-568-C.0, Generic Telecommunications Cabling for Customer Premises

TIA-568-C.1, Commercial Building Telecommunications Cabling Standard Part 1: General Requirements

TIA-568-C.2, Commercial Building Telecommunications Cabling Standard—Part 2: Balanced Twisted Pair Cabling Components

TIA-568-C.3, Optical Fiber Cabling Components Standard

TIA-569-B, Commercial Building Standards for Telecommunications Pathways and Spaces

TIA-606, Administration Standard for Commercial Telecommunications Infrastructures

ANSI J-STD-607-A, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

B. Other Reference Materials

BICSI Telecommunications Distribution Methods Manual (TDMM)

BICSI Wireless Design Reference Manual (WDRM)

Institute of Electrical and Electronic Engineers (IEEE)

National Electrical Manufacturers Association (NEMA)

Underwriters Laboratories (UL) Cable Certification and Follow Up Program

## 27 02 25.40 Definitions

**Access Floor** - A floor system that has removable floor panels.

**Building Backbone Cabling** – Cabling used to connect Floor Distributors (FD) or other local collection points to the Building Distributor (BD). Building backbone cabling typically carries aggregate traffic and, as such, impacts multiple network devices and users. Building backbone cabling may include either fiber optic or copper cabling or both.

**Building Distributor (BD)** – Termination point from which all building backbone cabling emanates and interconnection point for the network backbone. Commonly referred to as BDF and Intermediate Cross-connect (IC). There is one BD for each building and it feeds all FD's in the same building. The BD should be located so that all FD's served are within 300 cable meters (984 cable feet). All BD's are linked to the

**Campus Backbone Cabling** – Cabling used to connect Building Distributors (BD) or other key network segments to the Campus Distributor (CD). With rare exceptions, campus

backbone cabling carries aggregate traffic and typically impacts entire buildings worth of network devices and users and, as such, link redundancy with diverse routing is highly recommended. Campus backbone cabling almost exclusively consists of fiber optic cabling. Copper cabling may be used in short-distance (< 90m) applications. In such cases, lightning protection will usually be required by code.

**Campus Distributor (CD)** – Termination point from which all campus backbone cabling emanates and highest-level interconnection point for the network backbone. Commonly referred to as NOC and Main Cross-connect (MC). On smaller campuses, there is one CD for the campus. On larger campuses there might be several CD's with each CD serving several buildings. Besides linking to each of the BD's it serves, the CD is also the network interconnection point for data center links and links to service providers.

**Category 3 (Cat 3)** – A category of transmission performance, defined in EIA standards, that specifies electrical properties up to 10 MHz. Cat 3 is the minimum performance grade permissible and is used typically for analog voice distribution.

**Category 5e (Cat 5e) / Class D** – A category/class of transmission performance that specifies electrical properties up to 155.5 MHz. Capable of supporting copper-based, four-pair Gigabit Ethernet (IEEE 802.3ab 1000BASE-T) applications. Category 5e is defined in TIA/EIA 568B.2 standard. Class D is defined in the ISO 11801 standard.

**Category 6 (Cat 6) / Class E** – A category/class of transmission performance that specifies electrical properties up to 250 MHz. Refer to the TIA/EIA 568B family of standards for more information on Category 6 and ISO/IEC 11801 for more information on Class E requirements. Also refer to CENELEC EN50173.

**Category 6A (Cat 6) / Class $E_A$**– A category/class of transmission performance that specifies electrical properties up to 500 MHz and capable of supporting data applications operating at 10Gbps. Refer to the TIA/EIA 568B family of standards for more information on Category 6 and ISO/IEC 11801 for more information on Class EA requirements.

**Certification** – The testing and documentation of the transmission performance (e.g., Category 5e / Class D) of a permanent link or channel, based on sweep frequency (where applicable) testing of numerous parameters with results compared to a range of acceptable values. This project requires 100% certification (with documentation) of all permanent link cabling at the time of installation. Channel certification is optional and is the responsibility of the group using the channel.

**Channel** – The entire physical pathway between active equipment ports, inclusive of all patch cords, patch panels, jacks and cabling segments.

**Conduit** - A raceway of circular cross-section.

**Entrance Facility (EF)** – Termination point of service provider cables that have entered the building and location of service demarcation point (MPOE) and interconnection point to the network. Commonly referred to as Telco Room and Entrance Facility (EF). The EF is linked to the CD, where present, or to the BD.

**Floor Distributor (FD)** – Termination point for horizontal cabling and interconnection point for network access. Commonly referred to as IDF and Horizontal Cross-connect (HC) - FD quantities and locations are determined by building size and geometry so that all points served are within 90 cable meters (295 cable feet) of an FD. The FD feeds all Telecommunications Outlets (TO's) in its service zone. All FD's in a building are linked to the building's Building Distributor (BD) via backbone cabling.

**Horizontal Cabling** – Cabling used to connect individual work area outlets to local Floor Distributors (FD) or other collection points. Unlike backbone cabling, horizontal cabling does not typically carry aggregate traffic and, as such, impacts only single network devices or users. In buildings, horizontal cabling almost exclusively consists of copper cabling. Fiber optic cabling may be used where situations dictate but, unlike horizontal copper cabling, horizontal fiber optic cabling is not installed in advance as default building facilities. At this writing, horizontal copper cabling in many networks is capable of supporting Gigabit (1Gb/s) Ethernet applications as well as other applications of similar bandwidth.

**Permanent Link** – A stationary cabling segment, consisting of the permanently installed cable and the permanently affixed jack at both ends (typically at the outlet faceplate and closet patch panel, or on a patch panel on both ends). The concept is based on the assumption that, while patch cords might be disconnected or moved over time, the permanent cable and jacks will not be disturbed and the electrical characteristics of the permanent link will remain unaltered.

**Plenum** -A space within the building designed for the movement of environmental air; i.e., a space above a suspended ceiling or below an access floor.

**Raceway** - Any channel designed for holding wires or cables; i.e. conduit, electrical metal tubing, busways, wireways, ventilated flexible cableway.

## 27 02 30 Project Drawings

A. **Building composite floor plans:** Provide building floor plans showing outlet locations and jack configuration, types of jacks, run distance for each jack cable, and cable routing/locations. Identify TO's that, according to location and available pathway systems, require cable length greater than allowed by standards. Recommend alternatives for Owners Representative's consideration.

B. **Telecommunications space plans/elevations:** Include enlarged floor plans of TRs indicating layout of equipment and devices, including receptacles and grounding provisions. Submit detailed plan views and elevations of telecommunications spaces showing racks, termination blocks, and cable paths.

C. **Logical Drawings:** Provide logical riser or schematic drawings for all systems. Include schematic symbol key.

## 27 02 50 Substitutions

A. **Substitution requests:** Substitution requests will be considered only if submitted to Owner's Representative not less than 7 working days prior to project bid date. Acceptance or rejection of proposed substitution is at Owner's Representatives sole

discretion. No exceptions. Requests for substitutions shall be considered *not approved* unless approval is issued in writing by Owner's Representative.

B. **Rejection:** For equipment, cabling, wiring, materials, and all other products indicated or specified as *no substitutions* or *no alternates*, Owner does not expect nor desire requests for substitutions and alternate products other than those specified. Owner reserves right for Owner's Representative to reject proposed substitution requests and submissions of alternates without review or justification.

## 27 02 65 Warranty

### 27 02 65.10 Contractors Warranty

A. **General requirements:** Comply with additional requirements in contract general requirements and extended warranties required in other specification sections. Refer to all other 27xxx sections for specific additional warranty requirements that exceed or are in addition to those of this section.

B. **Contractor warranty:** Provide all services, materials, and equipment necessary for successful operation of entire telecommunications system and SCS system for a period of one year after system acceptance. Scope of warranty includes all equipment, devices, wiring, accessories, software, hardware, installation, programming, and configuration required to maintain a complete and operable system. Provide manufacturer's published recommended preventative maintenance procedures during warranty period. This shall apply to all items except those specifically excluded, or items wherein a longer period of service and warranty is specified or indicated. All warranties shall be effective for one year, minimum, from date Certificate of Final Acceptance is issued. Use of systems provided under this section for temporary services and facilities shall not constitute final acceptance of work nor beneficial use by Owner and shall not institute warranty period. The warranty shall cover repair or replacement of defective materials, equipment, workmanship, and installation that may be incurred during this period. Warranty work is to be done promptly and to Owner's satisfaction. In addition, warranty shall cover correction of damage caused in making necessary repairs and replacements under warranty. Additional warranty responsibilities are:

1. Obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in Owner's designated name. Replace material and equipment that require excessive service during guarantee period as determined by Owner.

2. Provide 2-business day service beginning on date of Substantial Completion and lasting until termination of warranty period. Service shall be at no cost to Owner. Service can be provided by installing contractor or by a separate service organization. Choice of service organization shall be subject to Owner's approval. Submit name and a phone number that will be answered on a 24-hour basis each day of week, for duration of service.

3. Submit copies of equipment and material warranties to Owner before final acceptance.

4. At end of warranty period, transfer manufacturers' equipment and material warranties still in force to Owner.

5. If warranty work problems cannot be corrected immediately to Owner's satisfaction, advise Owner in writing, describing efforts to correct situation, and provide analysis of cause for problem. If necessary to resolve problem, provide at no cost services of manufacturer's engineering and technical staff at site in a timely manner to analyze warranty issues, and develop recommendations for correction, for review and approval by Owner.

C. **Pathways Material and Installation warranty:** Provide all services, materials and equipment necessary to warrant the installation and performance of all pathway materials for a period of one year after beneficial use. Scope of warranty includes all equipment, devices, installation and other work required to maintain a complete and operable system. Provide manufacturers published recommended preventative maintenance procedures during warranty period.

D. **Grounding and Bonding Material and Installation warranty:** Provide all services, materials and equipment necessary for successful operation of GBS for a period of one year after beneficial use. Scope of warranty includes all equipment, devices, installation and other work required to maintain a complete and operable system. Provide manufacturers published recommended preventative maintenance procedures during warranty period.

E. **Firestopping Material and Installation warranty:** Provide all services, materials and equipment necessary to warrant the performance of all Firestopping material for a period of one year after beneficial use, or longer if required by the local AHJ. Scope of warranty includes all equipment, devices, installation and other work required to maintain a complete and operable system. Provide manufacturers published recommended preventative maintenance procedures during warranty period.

## 27 02 65.20 SCS Manufacturers Extended Warranty

A. SCS Systems will be covered by a two-part certification program provided by a single manufacturer and that manufacturer's certified vendor. Manufacturer shall administer a follow-on program through the Vendor to provide support and service to the purchaser. The first part is an assurance program, which provides that the certified system will support the applications for which it is designed, during the 20-year warranty of the certified system.

B. The second portion of the certification is a 20-year warranty provided by the manufacturer and the vendor on all products within the system (cords, telecommunications outlet/connectors, cables, cross-connects, patch panels, etc.).

C. In the event that the certified system ceases to support the certified application(s), whether at the time of cutover, during normal use or when upgrading, the manufacturer and vendor shall commit to promptly implement corrective action.

D. The cabling system must conform to the current issue of industry standard ANSI/TIA/EIA-568. All performance requirements of this document must be followed. As well, workmanship and installation methods used shall be equal to or better than that found in the BICSI (Building Industry Consulting Service International) ITSIM manual.

## 27 02 67 Completeness of Work

A. **Complete and usable work:** The contractor is responsible for providing complete and usable work according to contract documents. All materials and equipment shall be provided with all accessories and additional work required for field conditions, as well as additional work and accessories required for complete, usable, and fully functional construction and systems, even if not explicitly specified or indicated. Telecommunications system in this Contract shall be provided as complete and operable systems in full compliance with requirements on drawings and specification requirements. Drawings are diagrammatic and specifications are performance-based, and Contractor shall provide all work required to comply with drawings and specifications, even if not explicitly indicated or specified. Contractor shall be responsible for coordinating installation of electrical systems with all field conditions and work of other trades. Minimum clearances and work required for compliance with NFPA 70, *California Electrical Code* (C*EC*), and manufacturer's instructions shall be provided. Comply with additional requirements indicated for access and clearances. Contractor shall verify all field conditions and dimensions that affect selection and provision of materials and equipment, and shall provide any disassembly, reassembly, relocation, demolition, cutting, and patching required to provide work specified or indicated, including relocation and reinstallation of existing wiring and equipment. Contractor shall protect from damage resulting from Contractor's operations existing facility, equipment, and wiring. Extra charges for completion and contract time extension will not be allowed because of field conditions or additional work required for complete and usable construction and systems. Comply with additional requirements indicated for access and clearances.

B. **Drawings and specifications form complementary requirements;** provide work specified and not shown, and work shown and not specified as though explicitly required by both. Except where explicitly modified by a specific notation to contrary, it shall be understood that indication or description of any item, in drawings or specifications or both, carries with it instruction to furnish and install item, provided complete.

C. **Terms:** As used in this specification, *provide* means *furnish* and *install*. *Furnish* means "to purchase and deliver to project site complete with every necessary appurtenance and support," and *install* means "to unload at delivery point at site and perform every operation necessary to establish secure mounting and correct operation at proper location in project."

D. **Supplementary items:** Provide supplementary or miscellaneous items, appurtenances, devices, and materials necessary for a sound, secure and complete installation. Examine project drawings and other Sections of specifications for requirements that affect work of this section. Completely coordinate work of this section with work of other Sections and provide a complete and fully functional installation. Refer to all other drawings and other specifications sections that indicate types of construction in which work shall be installed and work of other sections with which work of this section must be coordinated

## 27 02 70 Project Conditions

A. **Field verification:** Carefully verify location, use and status of all material, equipment, and utilities that are specified, indicated, or deemed necessary for

removal. Verify that all materials, equipment, and utilities to be removed are completely inactive and will not be required or in use after completion of project. Replace with equivalent any material, equipment and utilities that were removed by Contractor that are required to be left in place.

B. **Existing utilities:** As applicable, do not interrupt utilities serving facilities occupied by Owner or others unless permitted under following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify owner in writing at least 14 days in advance of proposed utility interruptions. Do not proceed with utility interruptions without Owner's written permission.
2. Equipment installation:
   a. Determine suitable path for moving unit substation into place; consider Project conditions.
   b. Verify clearance requirements and locate equipment to meet installation tolerances.
   c. Revise locations and elevations from those indicated to those required to suit Project.

## 27 02 73 Delivery Storage and Handling

A. **General:** Contractor shall be responsible for the deliveries, storing and handling of all materials relative to the SCS systems, including materials supplied by others that are part of the SCS installation contract. Material shall be stored and protected according to manufacturer's instructions. Contractor shall be responsible for the security of all material during installation. For all material provided by contractor, or delivered to contractor on site, contractor assumes full responsibility and liability for any material shortages, damage, or loss due to storage and handling methods.

## 27 02 77 Examination

A. **General:** Prior to submitting a proposal, Contractor shall examine site, review Project drawings and specifications, and determine exact extent of work required. Contractor shall include in their proposals all materials, labor, and equipment required to complete required work indicated. Work that is necessary to obtain complete and usable Project as specified herein shall be included in Contractor's proposal, even if not indicated or specified.

B. **Bidders' questions:** Should bidders have questions as to intent of drawings and specifications, quality of materials to be used, and work to be performed, questions shall be submitted in writing to Owner's Representative in manner dictated by Owner's Representative. All answers and clarifications to drawings and specifications will be issued in writing.

C. Extra payment will not be allowed for claims for due to unfamiliarity with work to be performed by other trades, existing conditions at job site, local or state laws and codes, and alterations due to field conditions.

## 27 02 79 Additional Costs

A. **General:** Project acceptance inspections, final completion inspections, substantial completion inspections, and acceptance testing/demonstrations shall be conducted after verification of system operation and completeness by Contractor.

B. **Inspections and testing:** For Project acceptance inspections, final completion inspections, substantial completion inspections, and/or testing/demonstrations that require more than one site visit by Owner's Representative or Architect/Engineer to verify Project compliance for same material or equipment, Owner reserves right to obtain compensation from Contractor to defray cost of additional site visits that result from Project construction or testing deficiencies/incompleteness, incorrect information, or non-compliance with Project provisions. Owner's Representative will notify Contractor of hourly rates and travel expenses for additional site visits, and will issue an invoice to Contractor for additional site visits. Payment of additional site visit costs by Contractor is required within 30 days of invoicing. Owner reserves right to deduct additional costs defined herein that are indicated on past due invoices from Project amount due Contractor.

C. **Exclusions:** Contractor shall not be eligible for extensions of Project schedule or additional charges resulting from additional site visits that result from Project construction or testing deficiencies/incompleteness, incorrect information, or non-compliance with Project provisions.

**END of SECTION**

# 27 04 00 Execution

## 27 04 01 General Requirements

A. General: Sequence, coordinate, and integrate various elements of telecommunications system, materials, and equipment. Comply with the following requirements as a minimum.

A. Coordinate systems, equipment, and materials installation with other building components.

B. Verify all dimensions by field measurements.

C. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for wiring, cabling, and equipment installations.

D. Coordinate installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

E. Sequence, coordinate, and integrate installations of materials and equipment for efficient flow of Work. Give particular attention to large equipment requiring positioning prior to closing in building.

F. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide maximum headroom and access for service and maintenance as possible.

G. Coordinate connection of materials, equipment, and systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

H. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by Contract Documents, recognizing that portions of Work are shown only in diagrammatic form. In case of conflict among individual system requirements, request direction in writing from Owner’s Representative.

I. Install systems, materials, and equipment level and plumb, parallel, and perpendicular to other building systems and components, where installed in both exposed and un-exposed spaces.

J. Install cabling, wiring, and equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum interference with other installations.

K. Provide access panel or doors where units are concealed behind finished surfaces.

L. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

M. Comply with all requirements and work indicated on drawings.

N. Avoid interference with structure and with work or other trades, preserving adequate headroom and clearing doors and passageways to satisfaction of Owner and according to code requirements.

O. Install equipment and cabling/wiring so as to properly distribute equipment loads on building structural members provided for equipment support under other Sections. Roof-mounted equipment shall be installed and supported on structural steel or roof curbs as appropriate.

P. Provide suspended platforms, strap hangers, brackets, shelves, stands or legs as necessary for floor, wall and ceiling mounting of equipment as required.

Q. Provide steel supports and hardware for proper installation of hangers, anchors, guides, and other support hardware.

R. Obtain and analyze catalog data, weights, and other pertinent data required for proper coordination of equipment support provisions and installation.

S. Structural steel and hardware shall conform to ASTM standard specifications. Use of steel and hardware shall conform to requirements of AISC Code of Practice: Section Five.

T. Verify site conditions and dimensions of equipment to ensure access for proper installation of equipment without disassembly that would void warranty.

## 27 04 10 Equipment Installation

A. General: Install equipment according to manufacturer's written instructions. Install equipment level and plumb. Install wiring and cabling between equipment and all related devices.

B. Mounting: If neither the Owner's Instructions nor the individual section call out the required hardware mounting, use the following.

1. For equipment at walls, bolt units to wall or mount on structural steel channel strut bolted to wall.
2. For equipment not at walls, provide freestanding racks fabricated of structural steel members and slotted structural steel channel strut.
3. Use feet consisting of 0.25-inch-thick steel plates, 6 square inch, bolted to floor.
4. Use feet for welded attachment of vertical posts not over 3 feet on center.
5. Connect posts with horizontal U channel steel strut and bolt control equipment to channels.

C. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean devices internally using methods and materials as recommended by manufacturer.

D. Connections: Tighten wiring connectors, terminals, bus joints, and mountings, to include lugs, screws, and bolts according to equipment manufacturer's published torque tightening values for equipment connectors. In absence of published connection or terminal torque values, comply with torque values specified in UL 486A and UL 486B.

## 27 04 30 Demolition, removal, and Protection of work

A. Demolition and removal: Cut, remove, and legally dispose of selected equipment, components, and materials as indicated, including but not limited to removal of material, equipment, devices, and other items indicated to be removed and items made obsolete by new Work. Provide and maintain temporary partitions or dust barriers adequate to prevent spread of dust and dirt to adjacent areas.

B. Protection of work: Protect structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. During cutting and patching operations, protect adjacent installations. Patch finished surfaces and building components using new materials specified for original installation and experienced Installers.

## 27 04 33 Penetrations and Sleeves

A. General: Coordinate work with other sections. SCS Installation Contractor shall be responsible for the provision of cabling sleeves and conduits unless specifically provided by the Electrical Contractor. SCS Installation Contractor shall coordinate with Electrical Contractor to determine exact requirements.

B. When required, set sleeves in forms before concrete is poured. Provide core drilling as necessary if walls are poured or otherwise constructed without sleeves and wall penetration is required. Do not penetrate structural members. Provide sleeves and packing materials at all penetrations of foundations, walls, slabs (except on-grade), partitions, and floors. Sleeves shall meet requirements of pertinent specifications. Lay out penetration and sleeve openings in advance, to permit provision in work. Set sleeves and conduit in forms before concrete is poured. Provide remedial work where sleeves and conduits are omitted or improperly placed.

C. Sleeve fill: Sleeves that penetrate outside walls, basement slabs, footings, and beams shall be waterproof.

1. Fill slots, sleeves and other openings in floors or walls if not used.
2. Fill spaces in openings after installation of conduit or cable.
3. Fill for floor penetrations shall prevent passage of water, smoke, fire, and fumes.
4. Fill shall be fire resistant in fire floors and walls, and shall prevent passage of air, smoke, and fumes. See section 27 05 32 - Firestopping for Telecommunications Systems.
5. Sleeves through floors shall be watertight and shall extend 2 inches above floor surface.
6. Where raceways passing through openings are exposed in finished rooms, finishes of filling materials shall match and be flush with adjoining floor, ceiling, and wall finishes.

D. Conduit sleeves:

1. Annular space between conduit and sleeve shall be at least 1/4 inch.
2. Sleeves shall not be provided for slabs-on-grade unless specified or indicated otherwise.

3. For sleeves through rated fire walls and smoke partitions, comply with requirements for firestopping. See section 27 05 32 - Firestopping for Telecommunications Systems.

E. Supports: Do not support piping risers or conduit on sleeves.

F. Future use: Identify unused sleeves and slots for future installation.

## 27 04 39 Cleaning

A. Contractor is responsible for clean up of debris on a daily basis. Cost of clean up is the responsibility of the Contractor.

A. During progress of work, remove equipment and unused material. Put building and premises in neat and clean condition. Perform cleaning and washing required to provide acceptable appearance and operation of equipment to satisfaction of Owner's Representative.

B. After completion of Project, clean exterior surface of all equipment, including concrete residue, dirt, and paint residue. Final cleaning shall be performed prior to Project acceptance by Owner's Representative.

## 27 04 70 Special Responsibilities and Information

A. Coordination of information: Cooperate and coordinate with work of other sections in executing work of this section. Perform work such that progress of entire project, including work of other sections, shall not be interfered with or delayed. Provide information as requested on items furnished under this section, which shall be installed under other sections. Obtain detailed installation information from manufacturers of equipment provided under this section.

B. Information gathering: Obtain final rough-in dimensions or other information as needed for complete installation of items furnished under other sections or by Owner. Keep fully informed as to shape, size and position of openings required for material or equipment to be provided under this and other sections. Give full information so that openings required by work of this section may be coordinated with other work and other openings and may be provided for in advance. In case of failure to provide sufficient information in proper time, provide cutting and patching or have same done, at no expense to Owner.

C. Housekeeping pads: Provide information as requested as to sizes, number, and locations of concrete housekeeping pads necessary for floor mounted equipment.

D. Maintenance of equipment and systems: Maintain equipment and systems until Final Acceptance. Ensure adequate protection of equipment and material during delivery, storage, installation, and shutdown and during delays pending final test of systems and equipment because of seasonal conditions.

E. Use of premises: Use of premises shall be restricted as directed by Owner's Representative and as required below:

1. **Cleaning and rubbish removal:** Remove and dispose of dirt and debris, and keep premises clean. During progress of work, remove equipment and unused material. Put building and premises in neat and clean condition, and do cleaning and washing required to provide acceptable appearance and operation of equipment, to satisfaction of Owner's Representative.

2. **Rubbish Removal:** Provide for the removal from the site of all spoils, debris, boxes, packaging, crates, and trash generated from the work.

3. **Storage:** Store materials maintaining an orderly, clean appearance. If stored on site in open or unprotected areas, all equipment and material shall be kept off ground by means of pallets or racks, and covered with tarpaulins.

F. Protection of fireproofing:

1. Clips, hangers, clamps, supports and other attachments to surfaces to be fireproofed shall be installed, if possible, prior to start of spray fire proofing work.

2. Conduits and other items that would interfere with proper application of fireproofing shall be installed after completion of spray fire proofing work.

3. Patching and repairing of fireproofing due to cutting or damaging to fireproofing during course of work specified under this section shall be performed by installer of fireproofing and paid for by section responsible for damage and shall not constitute grounds for an extra to Owner.

G. Temporary utilities: Refer to contract general requirements regarding requirements.

H. Movement of materials: Unload materials and equipment delivered to site. Pay costs for rigging, hoisting, lowering and moving equipment on and around site, in building or on roof.

## 27 04 80 Division of Work

A. General: Division of work responsibility matrix at the end of this section is for Contractor's reference to clarify roles of various manufacturers, installers, subcontractors, and trades involved in telecommunications system Project.

B. Contractor holding contract with Owner is responsible for coordinating work of all subcontractors to provide a complete and usable Project complying with contract provisions of Project documents.

C. Failure to coordinate work by subcontractors and suppliers will not be considered justification for additional compensation or extension of schedule.

**END of SECTION**

# 27 05 00 Common Work Results for Communications

## 27 05 26 Grounding and Bonding for Communications Systems

## 1. GENERAL

### 1.1. Work Includes

Provide all labor, materials, and equipment for the complete installation of work called for in the Contract Documents.

### 1.2. Scope of Work

A. This section includes the minimum requirements for the equipment and cable installations in communications equipment rooms (Telecommunications Closets).

B. Included in this section are the minimum composition requirements and installation methods for the following:

1. Grounding Electrode System
2. Busbars
3. Bonding accessories

### 1.3. Quality Assurance

A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner or Owner Representative. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where “approved equal” is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

### 1.4. Submittals

A. Provide product data for the following:

1. Manufacturers cut sheets, specifications and installation instructions for all products.

## 2. PRODUCTS

### 2.1. Grounding Electrode System

A. Grounding Electrode System

1. When required the Grounding Electrode System shall meet the following
   a. Active grounding system constantly replenishing moisture into the soil
   b. Provide low resistance to ground
   c. Provide season to season stability
   d. Be maintenance-free for 30 years
   e. Contain no hazardous materials or chemicals
2. Approved Manufacturers:

a. Cooper BLine, Burndy, or approved equal

## 2.2. Wall-mount Busbars

A. Telecommunications Main Grounding Busbar (TMGB)

1. Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
2. The busbar shall be 4" (100 mm) high and 20" (510 mm) long and shall have 30 attachment points (two rows of 15 each) for two-hole grounding lugs.
3. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 27 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4) mm) hole centers.
4. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
5. The busbar shall be UL Listed as grounding and bonding equipment.
6. Approved manufactures:
   a. Chatsworth (CPI), Erico Caddy, Cooper BLine, or approved equal

B. Telecommunications Grounding Busbar (TGB)

1. Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
2. The busbar shall be 2" (50 mm) high and 12" (300 mm) long and shall have 9 attachment points (one row) for two-hole grounding lugs.
3. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 6 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
4. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
5. The busbar shall be UL Listed as grounding and bonding equipment.
6. Approved manufactures:
   a. Chatsworth (CPI), Erico Caddy, Cooper BLine, or approved equal

## 2.3. Bonding Accessories

A. Below Grade:

1. Exothermic-welded type connectors.

B. Above Grade:

1. Bonding Jumpers: compression type connectors, using zinc-plated fasteners and external tooth lock washers.
2. Ground Busbar: Two-hole compression type lugs using tin-plated copper or copper alloy bolts and nuts.
3. Rack and Cabinet Ground Bars: one-hole compression-type lugs using zinc plated or copper alloy fasteners.
4. Cable Shields: Make ground connections to multi-pair communications cables with metallic shields using shield bonding connectors with screw stud connection.

C. Grounding conductor splices shall be joined with mechanical crimped sleeve designed to have two crimps per side with proper indents markings. Crimp sleeves shall be copper alloy.

D. Grounding conductor shall be terminated with a mechanical crimped type lug designed to have two crimps, spade section of have two bolts and made of copper alloy.

E. Two Mounting Hole Ground Terminal Block

1. Ground terminal block shall be made of electroplated tin aluminum extrusion.
2. Ground terminal block shall accept conductors ranging from #14 AWG through 2/0.
3. The conductors shall be held in place by two stainless steel set screws.
4. Ground terminal block shall have two 1/4” (6.4 mm) holes spaced on 5/8” (15.8 mm) centers to allow secure two-bolt attachment to the rack or cabinet.
5. Ground terminal block shall be UL Listed as a wire connector.

F. Compression Lugs

1. Compression lugs shall be manufactured from electroplated tinned copper.
2. Compression lugs shall have two holes spaced on 5/8” or 1” centers, as stated below, to allow secure two bolt connections to busbars.
3. Compression lugs shall be sized to fit a specific size conductor, sizes #6 to 4/0, as stated below.
4. Compression lugs shall be UL Listed as wire connectors.

G. Antioxidant Joint Compound

1. Oxide inhibiting joint compound for copper-to-copper, aluminum-to-aluminum or aluminum-to-copper connections.

H. C-Type, Compression Taps

1. Compression taps shall be manufactured from copper alloy.
2. Compression taps shall be C-shaped connectors that wrap around two conductors forming an irreversible splice around the conductors; installation requires a hydraulic crimping tool
3. Compression taps shall be sized to fit specific size conductors, sizes #2 AWG to 4/0, as stated below.
4. Compression taps shall be UL Listed.

I. Pedestal Clamp With Grounding Connector

1. Pedestal clamp shall be made from electroplated tinned copper or bronze. Installation hardware will be stainless steel.
2. Pedestal clamps shall be sized to fit a specific size conductor, size #6 and/or 2/0, as stated below.
3. Pedestal clamp installation hardware shall be sized to attach to round and/or square raised access floor pedestals that are 1-1/8” to 1-3/4” in diameter, as stated below.
4. Pedestal clamp shall provide straight (in-line) or cross (intersection) support for up to two conductors.
5. Pedestal clamp shall be UL Listed as grounding and bonding equipment.

J. Pipe Clamp with Grounding Connector

1. Pipe clamp shall be made from electroplated tinned bronze. Installation hardware will be stainless steel.
2. Pipe clamp shall be sized to fit up to two conductors ranging in size from #6 to 250 MCM; conductors must be the same size.
3. Pipe clamp installation hardware shall be sized to attach to pipes, sizes 1" to 6" (.75" to 6.63" in diameter), as stated below.
4. Pipe clamp shall be UL Listed as grounding and bonding equipment.

K. Equipment Ground Jumper Kit

1. Kit includes one 24"L insulated ground jumper with a straight two hole compression lug on one end and an L-shaped two hole compression lug on the other end, two plated installation screws, an abrasive pad and a .5 once tube of antioxidant joint compound.
2. Ground conductor is an insulated green/yellow stripe #6 AWG wire
3. Lugs are made from electroplated tinned copper and have two mounting holes spaces .5" to .625" apart that accept 1/4" screws.
4. Jumper will be made with UL Listed components

L. Approved Manufacturers:

1. Cooper BLine, Burndy, or approved equal

## 2.4. Bonding Conductors

A. Cable Tray Bonding Conductor

1. Green # 6 AWG insulated bonding jumper with appropriate lugs or manufactured braided copper grounding jumper equal to a # 6 AWG cable.

B. Equipment Fame Bonding Conductor

1. Bonding Conductor shall be run neatly and uniformly to the equipment, racks and trays.

C. Bonding Conductor (BC)

1. Green insulated copper bonding conductor, size as requires by NEC.
2. The BC shall be, as a minimum the same as the TBB.
3. Bare conductors are acceptable where plenum or exposed areas limit the use of insulated conductors.

D. Telecommunications Bonding Backbone (TBB)

1. Green insulated copper conductor, minimum as specified in the table below, size 6 AWG. The TBB shall be sized at 2 kcmil per linear foot of conductor length. Insulation shall meet fire ratings of its pathway.
2. Table 1 – Conductor Sizing

| Maximum TMGBB to TGBB Length (L) (feet) | Conductor cross-sectional area (minimum), AWG |
|---|---|
| L ≤ 13ft | # 6 |

| | |
|---|---|
| 4 < L ≤ 14 – 20ft | # 4 |
| 6 < L ≤ 21 – 26ft | # 3 |
| 8 < L ≤ 27 – 33ft | # 2 |
| 10 < L ≤ 34 – 41ft | # 1 |
| 13 < L ≤ 42 – 52ft | # 1/0 |
| 16 < L ≤ 53 – 66ft | # 2/0 |
| 20 < L ≤ 67 – 84ft | # 3/0 |
| 26 < L ≤ 85 – 105ft | # 4/0 |
| 32 < L ≤ 106 – 125ft | 250mcm |
| 38 < L ≤ 126 – 150ft | 300mcm |
| 46 < L ≤ 151 – 175ft | 350mcm |
| 53 < L ≤ 176 – 250ft | 500mcm |
| 76 < L ≤ 251 – 300ft | 600mcm |
| Greater than 301ft | 750mcm |
| For lengths in excess of those shown above, the conductor cross-sectional area should be calculated as 2kcmil/ft. | |

E. Ground Rods

1. Copper clad steel, 3/4-inch diameter by 10 feet long, conforming to UL 467.

## 3. EXECUTION

### 3.1. Installation

A. Outdoor grounding and bonding connections.

1. All outdoor grounding and bonding (earthing) connections shall be accomplished using exothermic welding.

B. Wall-Mount Busbars

1. Attach busbars to the wall with appropriate hardware according to the manufacturer's installation instructions.
2. Conductor connections to the TMGB or TGB shall be made with two-hole bolt-on compression lugs sized to fit the busbar and the conductors.

3. Each lug shall be attached with stainless steel hardware after preparing the bond according to manufacturer recommendations and treating the bonding surface on the busbar with antioxidant to help prevent corrosion at the bond.
4. The wall-mount busbar shall be bonded to ground as part of the overall Telecommunications Bonding and Grounding System.

C. Rack-Mount Busbars and Ground Bars

1. When a rack or cabinet supports active equipment or any type of shielded cable or cable termination device requiring a ground connection, add a rack-mount horizontal or vertical busbar or ground bar to the rack or cabinet. The rack-mount busbar or ground bar provides multiple bonding points on the rack for rack and rack-mount equipment.
2. Attach rack-mount busbars and ground bars to racks or cabinets according to the manufacturer's installation instructions.
3. Bond the rack-mount busbar or ground bar to the room's TMGB or TGB with appropriately sized hardware and conductor.

D. Ground Terminal Block

1. Every rack and cabinet shall be bonded to the TMGB or TGB.
2. Minimum bonding connection to racks and cabinets shall be made with a rack-mount two-hole ground terminal block sized to fit the conductor and rack and installed according to manufacturer recommendations.
3. Remove paint between rack/cabinet and terminal block, clean surface and use antioxidant between the rack and the terminal block to help prevent corrosion at the bond.

E. Pedestal Clamp

1. At minimum, bond every sixth raised access floor pedestal with a minimum #6 AWG conductor to the TMGB or TGB using a pedestal clamp sized to fit the pedestal and the conductor and installed according to the manufacturer's recommendations.
2. If pedestal clamps are used to construct a signal reference grid, bond the signal reference grid to the TMGB or TGB and bond each rack and/or cabinet to the signal reference grid using a compression tap or similar non-reversible bonding component sized to fit both conductors.
3. Remove paint between the pedestal and pedestal clamp, clean surface and use antioxidant between the pedestal and the clamp to help prevent corrosion at the bond.
4. Remove insulation from conductors where wires attach to the pedestal clamp.

F. Pipe Clamp

1. Bond metal pipes located inside the data center computer room with a minimum #6 AWG conductor to the TMGB or TGB using a pipe clamp sized to fit the pipe and the conductor and installed according to the manufacturer's recommendations.
2. Remove paint between the pipe and pipe clamp, clean surface and use antioxidant between the pipe and the clamp to help prevent corrosion at the bond.
3. Remove insulation from conductors where wires attach to the pipe clamp.

G. Equipment Ground Jumper Kit

1. Bond equipment to a vertical rack-mount busbar or groundbar using ground jumper according to the manufacturer's recommendations.
2. Clean the surface and use antioxidant between the compression lugs on the jumper and the rack-mount busbar or groundbar to help prevent corrosion at the bond.

**END of SECTION**

# 27 05 28 Pathways for Communications Systems

## 1. GENERAL

### 1.1. Scope of Work

A. Install empty raceway system, including underfloor and overhead distribution system, fish wire, terminal cabinets, outlet boxes, floor boxes, pull boxes, cover plates, conduit, sleeves and caps, cable troughs, service poles, miscellaneous and positioning material to constitute complete system, as indicated for distribution of Telecommunications wiring which includes cables for Data, Voice, Video, Audio, Security, and future signal requirements.

B. The location at which all new telecommunications wiring will terminate is called a Telecom Outlet (TO). There are several styles of outlets:

1. New construction
2. Existing construction typical
3. Existing construction variations
4. Telephone (Voice) only
5. Data only

C. Furnish and install conduit stubs in walls and floors for cable routes.

### 1.2. Quality Assurance:

A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner or Owner Representative. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where “approved equal” is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

B. Assure that the "as installed" system is correctly and completely documented including engineering drawings, manuals, and operational procedures in such a manner as to support maintenance and future expansion of the system.

### 1.3. Submittals

A. Product Data: For features, ratings, and performance of each component specified.

B. Submit manufacturer’s instructions for storage, handling, protection, examination, preparation, operation, and installation of products. Include application conditions or limitations of use stipulated by any product testing agency. Submit for the following:

1. Wall Boxes
2. Raceway
3. Conduit
4. Conduit Bushings

C. Shop Drawings:

1. Component List: List manufacturer, part number, and quantity of each component.
2. Include dimensioned plan and elevation views of equipment rooms, labeling each individual component. Show raceway assemblies, method of field assembly, workspace requirements, and access for cable connections.

## 2. PRODUCTS

### 2.1. Telecom Outlets (TO)

A. Cat5e and Cat6 TO consists of one (1) 5" square by 2-7/8" deep flush mounted box. Each outlet box shall have a EMT conduit stubbed above the drop ceiling or extended into the hallway cabletray. Conduits size is as follows UON:

1. For Outlets with 3 or less cables, use a 1.25” EMT conduit
2. For Outlets with 3-6 cables, use a 1.50” EMT conduit
3. For all other sizes, calculate fill ratio at 40% for proper sized conduit

B. Cat6A TO consists of one (1) 5" square by 2-7/8" deep flush mounted box. Each outlet box shall have a EMT conduit stubbed above the drop ceiling or extended into the hallway cabletray. Conduits size is as follows UON:

4. For Outlets with 3 or less cables, use a 1.25” EMT conduit
5. For Outlets with 3-6 cables, use a two 1.50” EMT conduit
6. For all other sizes, calculate fill ratio at 40% for proper sized conduit

C. Existing surface-mounted construction TO typically consists of surface-mounted raceway including base, cover, end fitting, entrance end fitting, and (2) 1" EMT conduits stubbed out top of entrance end fitting to above ceiling or out to nearest hallway distribution system. Size of the raceway is site dependent based on number of conductors to be installed.

D. The intent of the installation of the TOs which consist of the raceway is as follows:

1. Where ceilings are accessible, the raceway and entrance end fitting shall extend above the ceiling and the conduits installed above the ceiling in the room to the nearest hallway distribution system.
2. Where ceilings are partially accessible, or if the Drawings and/or Specifications indicate installation of access panels, the raceway shall extend above the ceiling and the conduits installed above the ceiling in the room to the nearest hallway distribution system.
3. Where ceilings are inaccessible or no ceilings exist, the raceway shall extend up as close to the ceiling as practical to allow installation of conduits as high as possible to the nearest hallway distribution system.

### 2.2. Horizontal Distribution Systems

A. Conduit System (Renovations only, where conduit exists)

1. Provide conduits secured to wall above corridor ceilings as shown on the Drawings or as specified herein for installation of telecommunications cables. Any exposed conduit
2. Corridor conduits shall be 4" EMT, furnished in 10 foot lengths wherever possible, with no sharp edges, reamed as necessary, evenly supported at two locations per 10 foot section spacing. Conduits shall be sized and quantified to account for

handling cables in all TO conduits at 40% fill back to the TR and/or EMT are required.

3. All conduits shall be installed stacked and attached to walls unless conditions exist which prohibit this type of installation. When this condition exists, mount conduits side-by-side supported with 3/8" rod attached to building structure utilizing unistrut channel to form a trapeze. Double nut the top and bottom at the unistrut. Utilize conduit clamp to secure conduits to unistrut.
4. Provide measured pull line in each conduit rated at 1200 lbs. minimum. Increments must be in 12" steps.
5. Grounding of conduits is not required per CEC #250-33, Exception No. 2. shall be painted except conduit above suspended ceilings or in mechanical, electrical or telecommunication rooms. Color to match that of surface installed upon or as directed by Owner's Representative. Coordinate with other trades prior to painting.
6. Provide restorable fire stops inside and around conduits as recommended by UL1479 or ASTM E814 for all conduits penetrating fire-rated construction. Fire rated construction to be verified with AHJ. See Section 27 05 32 for more firestopping information.

B. Corridor Cable Tray System

1. Complete wall mounted or suspended aluminum cable tray system and necessary accessories shall be provided as shown on plans. Install entire cable tray system in accordance with manufacturer's minimum installation practices and all local governing codes.
2. Coordinate installation of cable tray with other trades to allow a minimum of 12" above, 12" in front, and 12" below of clearance from piping, conduits, ductwork, etc. Allowance must be provided for access to the tray with reasonable room to work. Obstructions to the tray must be minimized and cannot block more than 6 feet of the tray at any point in the run.
3. Submittal drawings, in the form of 8 ½"x 11" catalog cut sheets, shall be provided for the following items: cable tray, fittings, accessories and load data.
4. Cable tray shall not be loaded beyond 60% of manufacturer's recommended load capacity.
5. Install wall mounted cable tray on both sides of hallway as shown on drawings and where applicable.
6. Where a new cable tray distribution system encounters a wall, install sufficient 4" EMT sleeves through the wall so cabling does not exceed 20% fill.
7. Where cable tray is exposed below ceiling, install the appropriate solid bottom inserts to conceal cables.
8. Install cable tray dropouts where large quantities of cables exit the distribution system.
9. Cable tray must be sized to facilitate sufficient growth capacity for migration cable plant to coexist in same tray as existing cable plant, wherever possible.
10. Manufacturer of cable tray in corridors and telecom rooms shall be:
    Chatsworth (CPI), Erico Caddy, Cooper BLine, or approved equal

C. Telecommunication Room Cable Tray System

1. TR cable tray shall completely wrap all walls within the room. Cable tray shall extend over all equipment frames.

2. Cable tray shall be a minimum width of 2” high x 12” wide. Cable tray may be sized upwards if fill ratio requirements need to be met based on cable quantities.
3. Manufacturer of tubular ladder type cable tray in telecommunication rooms shall be Cooper BLine, Chatsworth (CPI), CommScope or approved equal.
4. Cable tray shall be 12 inch cable runway.
5. Rectangular steel tubing cross members welded at 12-inch intervals. Finish in black enamel. Chatsworth (CPI), Part Number 11275-712 or equivalent.
    a. 12-inch Wall Angle Assembly Kit – Chatsworth (CPI) Part Number 11421-712 or equivalent.
    b. 3-inch Channel Rack–To-Runway Mounting Plate - Chatsworth (CPI) Part Number 12730-712 or equivalent.
    c. End Closing Tube - Chatsworth (CPI) Part Number 10642-001 or equivalent.
    d. Corner Clamp - Chatsworth (CPI) Part Number 11700-712 or equivalent (2 required per End Closing Tube to complete assembly).

D. All open pathway/trays shall be installed a minimum of six (6) inches away from any light fixture or other source of EMI (Electromagnetic Interference).

E. All pathways shall be grounded per CEC Article 250.

F. Provide external grounding strap at expansion joints, sleeves and crossover and at other locations where pathway/tray continuity is interrupted.

G. Support all pathways from building construction. Do not support pathways from ductwork, piping, or equipment hangers.

H. Install cable tray level and straight unless noted on the construction drawings

## 2.3. Station Conduits

Station conduit is defined as conduit that originates at the TO and rises within the walls or is exposed from a raceway and extends up into the drop ceiling or over to the hallway distribution system.

A. Provide station conduits from TOs to above the drop ceiling or extend over to the hallway distribution systems consisting of 1” EMT minimum or appropriate size as shown on the Drawings or as specified herein for installation of telecommunications cables.

B. Provide an insulating press fit bushing on all telecommunications conduits including interconnecting nipples and stub to distribution system. To prevent conflicts with other cables or conduits to cable tray, the conduit shall be stubbed not less than 6" above or below conduit/cable tray center line. Where space permits, every effort shall be made to bend station conduits down such that the flow of installed cables promotes the minimum length back to the TR and the least amount of bends in the cables. Bushings must be rated to be used in an environmental air handling space (Plenum).

C. Manufacturer of insulating bushing on all telecommunication conduits shall be:

1. Arlington, Erico Caddy or equivalent

D. Provide pull line in each empty conduit to hallway distribution system.

E. Indelibly mark station conduit at hallway distribution end with Room # that conduit serves.

F. The use of 90 degree electrical pulling elbows is prohibited.

G. Do not include more than two 90 degree bends between pulling points when installing station conduit runs. If the path of the station conduits requires more than 180 degrees of total bends, installation of an appropriate sized junction box is required. See section 2.4 for junction box requirements.

H. Place an appropriate sized junction box in each individual station conduit run that exceeds 100 feet in length.

I. The use of a third bend in a conduit is only acceptable if:

1. The total conduit run is reduced by 15%.
2. The conduit size is increased to the next trade size.
3. One of the bends is located within 12” of the cable feed end.

## 2.4. Junction Box Requirements for Station Conduits

A. If the station conduit route exceeds the 180 degree of total bends limitation, an appropriately sized junction box is required within a straight section of the conduit run.

B. Each station conduit run requires a separate junction box. The sharing of a junction box by multiple conduits is prohibited.

C. A junction box shall not be used in place of a bend. All junction boxes in station conduit paths shall be installed within a straight section of the conduit run.

## 2.5. Service Entrance Conduits

A. Entrance conduits shall be continuous into the building and to the ER. Securely fasten all entrance conduits to the building to withstand any cable placing operation. Do not include more than two 90 degree bends between pulling points when installing entrance conduits.

B. On exterior wall penetrations, seal both sides of the wall around outside of conduit with hydraulic cement to prevent water from entering the building. Seal the inside of the conduit on both sides with conduit plugs, water plugs, or duct sealer to prevent water, vapors, or gases from entering the building.

## 2.6. Pathway Requirements for Entrance Conduits

A. If the entrance conduits exceed the 180 degree of total bends limitation, an appropriate sized junction box, manhole, or handhole is required.

B. As-built drawings of entrance conduit path required to be submitted to Owner’s Representative before covered with soil.

## 2.7. Riser Conduits

Riser conduits shall only be used when noted on the Construction Documents for special applications only. Riser conduits are not required as a general rule for the riser system. However, when required:

A. Minimum of (2) 4” conduits shall be installed between the ER room and each TR room as shown on the Drawings.

B. Conduits entering ER and TR rooms shall be reamed or bushed and terminated not more than 4" from entrance wall and within 12” of room corners.

C. Conduits entering ER and TR rooms from below floor shall be terminated not more than 4" above finished floor.

D. Conduits for riser cables shall be continuous and separate from all other conduit or enclosed raceway systems. Do not include more than two 90 degree bends between pulling points when installing riser conduits. Where junction boxes are required, locate in accessible areas, such as above suspended ceilings in hallways.

E. Conduits shall not be less than 4" trade size and be equipped with a measured pull line at 12” increments rated at a minimum 1200 pound test.

F. Provide restorable fire stops inside and around conduits as recommended by UL1479 or ASTM E814 for all conduits penetrating fire-rated construction. Fire-rated construction to be verified with AHJ. See Section 27 05 32 for more firestopping information.

G. Provide an insulating press fit bushing on all telecommunications riser conduits. Bushings must be rated to be used in an environmental air handling space (Plenum).

1. Manufacturer of insulating bushing on all telecommunication conduits shall be Arlington or equal.

H. Riser conduits shall not be used for the distribution of horizontal cables.

### 2.8. Firestopping

A. In all buildings, floor/ceiling assemblies, stairs, and elevator penetrations must be sealed with a 2-hour fire stop assembly at a minimum, unless otherwise noted.

B. Contact Owner’s Representative to identify walls which are fire-rated construction. Walls must be sealed with a 2-hour fire stop assembly at a minimum.

C. Communication pathways requiring fire stopping shall utilize removable/re-usable fire stopping putties for ease of Moves, Adds, and Changes.

D. All fire stopping penetrations shall conform to the recommended practices listed in UL1479 or ASTM.

E. See Section 27 05 32 - Firestopping for Telecommunications Systems

## 3. EXECUTION

### 3.1. General Requirements

A. The intention of the telecommunications conduits is to provide a route between ER and TR rooms, routes from the TRs throughout building floors to hallways, and routes from hallway distribution systems into rooms to individual TOs for telecommunications cabling.

B. Installation of new pathways shall not interfere with existing pathways in such a way that installation of new cables within the existing pathway is made more difficult.

## 3.2. Examination

A. Examine areas to receive cable management system. Notify the Owner's Representative of conditions that would adversely affect the installation or subsequent utilization of the system.

B. Do not proceed with installation until unsatisfactory conditions are corrected.

## 3.3. Installation

A. Install in accordance with recognized industry practices, to ensure that the equipment complies with requirements of the CEC, and applicable portions of NFPA 70B and NECA "Standards of Installation" pertaining to general electrical installation practice.

B. Coordinate installation with other trades.

C. Field verification is required before installation.

D. Install cable management system at locations indicated on the drawings and in accordance with manufacturer's instructions.

**END OF SECTION**

# 27 05 29 Hangers and Supports for Communications Systems

## 1. GENERAL

### 1.1. Work Includes

The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of non-continuous cable supports as described in this specification.

### 1.2. Scope of Work

This Section includes the minimum requirements for the support structures for the Communications Systems for the project as outlined in the Bid Document.

A. Non-continuous cable supports (2.3A)
B. Adjustable non-continuous cable support sling (2.3B)
C. Multi-tiered non-continuous cable support assemblies (2.3C)
D. Non-continuous cable support assemblies from tee bar (2.3D)
E. Non-continuous cable support assemblies from drop wire/ceiling (2.3E)
F. Non-continuous cable support assemblies from beam, flange (2.3F)
G. Non-continuous cable support assemblies from C & Z Purlin (2.3G)
H. Non-continuous cable support assemblies from wall, concrete, or joist (2.3H)
I. Non-continuous cable support assemblies from threaded rod (2.3I)
J. Raised floor non-continuous cable support assemblies (2.3J)
K. Cantilever-Mounted Option for non-continuous cable supports (2.3K)
L. Installation accessories for non-continuous cable supports (2.3L)

### 1.3. Submittals

A. Submit product data on non-continuous cable support devices, including attachment methods. Product data to include, but not limited to materials, finishes, approvals, load ratings, and dimensional information.

### 1.4. Quality Assurance

A. Non-continuous cable supports and cable support assemblies shall be listed by Underwriters Laboratories for both Canadian and US standards (cULus).
B. Non-continuous cable supports shall have the manufacturers name and part number stamped on the part for identification.

### 1.5. Coordination

A. Coordinate installation of hangers, supports and cables with other trades.

## 2. PRODUCTS

### 2.1. Acceptable Manufacturers

A. Subject to compliance with these specifications, non-continuous cable supports shall be as manufactured by:

## 2.2. Non-continuous Cable Support Systems

A. Non-continuous cable supports
   1. Non-continuous cable supports shall provide a bearing surface of sufficient width to comply with required bend radii of high-performance cables; cULus Listed.
   2. Non-continuous cable supports shall have flared edges to prevent damage while installing cables.
   3. Non-continuous cable supports sized 1 5/16” and larger shall have a cable retainer strap to provide containment of cables within the hanger. The cable retainer strap shall be removable and reusable and be suitable for use in air handling spaces.
   4. Non-continuous cable supports shall have an electro-galvanized or G60 finish and shall be rated for indoor use in non-corrosive environments.
   5. Stainless Steel non-continuous cable supports are intended for indoor and outdoor use in non-corrosive environments or where only mildly corrosive conditions apply.
   6. Non-continuous cable supports shall be as manufactured by:

B. Adjustable non-continuous cable support sling
   1. Constructed from steel and woven laminate; sling length can be adjusted to hold up to 425 4-pair UTP; rated for indoor use in non-corrosive environments. Rated to support Category 5e and higher cable, or optical fiber cable; cULus Listed.
   2. Adjustable non-continuous cable support sling shall have a static load limit of 100 lbs.
   3. Adjustable non-continuous cable support sling shall be suitable for use in air handling spaces.
   4. If required, assemble to manufacturer recommended specialty fasteners including beam clips, flange clips, C and Z purlin clips.
   5. Acceptable products:

C. Multi-tiered non-continuous cable support assemblies
   1. Multi-tiered non-continuous cable support assemblies shall be used where separate cabling compartments are required. Assemblies may be factory assembled or assembled from pre-packaged kits. Assemblies shall consist of a steel angled hanger bracket holding up to six non-continuous cable supports, rated for indoor use in non-corrosive environments; cULus Listed.
   2. If required, the multi-tier support bracket may be assembled to manufacturer recommended specialty fasteners including beam clamps, flange clips, C and Z purlin clips.
   3. The multi-tiered support bracket shall consist of:

D. Non-continuous cable support assemblies from tee bar
   1. Tee bar support bracket with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments; cULus Listed.
   2. Acceptable products:

E. Non-continuous cable support assemblies from drop wire/ceiling
   1. Fastener to wire/rod with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments; cULus Listed.
   2. Acceptable products:

F. Non-continuous cable support assemblies from beam, flange

1. Fastener to beam or flange with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments; cULus Listed.
2. Acceptable products:

G. Non-continuous cable support assemblies from C & Z Purlin
1. Fastener to C or Z purlin with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments, cULus Listed.
2. Acceptable products:

H. Non-continuous cable support assemblies from wall, concrete, or joist
1. Fastener to wall, concrete, or joist with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments, cULus Listed.
2. Acceptable products:

I. Non-continuous cable support assemblies from threaded rod
1. Fastener to threaded rod with one non-continuous cable support, factory or jobsite assembled, rated for indoor use in non-corrosive environments, cULus Listed.
2. The multi-tiered support bracket shall have a static load limit of 300 lbs.
3. U-hooks and Double J-hook shall attach directly to threaded rod using standard nuts.
4. Acceptable products:

J. Raised floor non-continuous cable support assemblies
1. Fastener to raised (access) floor pedestal with one non-continuous cable support, factory or jobsite assembled, rated for indoor use in non-corrosive environments; cULus Listed.
2. Acceptable products:

K. Cantilever-Mounted cable supports
1. U-hook shall be able to be assembled to a wide variety of wall mount brackets.
2. Spacing of individual U-hooks as needed, max of 4’ to 5’ apart.
3. U-hooks may have the optional attachment of a cable roller for ease in pulling cables.
4. Acceptable products:

L. Installation accessories for non-continuous cable supports
1. Cable Pulley
   a. Non-continuous cable supports may be used as an installation tool when a removable pulley assembly is included. The pulley shall be made of plastic and be without sharp edges. The pin and bail assembly must be able to be secured to the J-Hook during cable installation. The pulley must remain secured while cables are being pulled.
   b. The pin and roller assembly must be removed after cables are installed.
   c. Acceptable products:
2. Cable Protector
   a. The protective steel tube shall fit over threaded rod and be at least 4” in length.
   b. The tube shall prevent damage to cables placed in or pulled through CAT-CMTM U-hooks. The tube shall not inhibit the pulling of cables.

## 2.3. Finishes

A. ASTM B633 Standard Specification for Electro-deposited Coatings of Zinc on Iron and Steel

ASTM B 695 Standard Specification for coatings of Zinc Mechanically Deposited on Iron and Steel
ASTM A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A924/A924M Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

B. Non-continuous cable supports used where only mildly corrosive conditions apply shall be stainless steel, AISI type 304.

## 3. EXECUTION

### 3.1. Installation

A. Installation and configuration shall conform to the requirements of the current revision levels of California Electrical Code (CEC), ANSI/ EIA/TIA Standards 568 & 569, NFPA 70 (National Electrical Code), applicable local codes, and to the manufacturer's installation instructions.
B. Do not exceed load ratings specified by manufacturer.
C. Adjustable non-continuous support sling shall have a static load limit of 100 lbs.
D. Follow manufacturer's recommendations for allowable fill capacity for each size non-continuous cable support.
E. Locate pathways per Telecommunications Drawings.

**END of SECTION**

# 27 05 32 Firestopping for Telecommunications Systems

## 1. GENERAL

### 1.1. Scope

A. This SECTION describes the requirements for furnishing and installing firestopping for fire-rated construction. This includes all openings in fire-rated floors, walls and other rated elements of construction, both blank (empty) and those accommodating items such as cables, conduits, pipes, ducts, etc.

B. Fireblocking for Concrete Floor or Wall Sleeved Cables.

C. Fireblocking for Gypsum Wall Sleeved Cables.

D. Fireblocking for Concrete Block Wall Sleeved Cables.

### 1.2. Related Documents:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 7 Specification Sections, apply to this Section.

### 1.3. Submittals

A. Submit manufacturer's product literature and installation procedures for each type of Firestop material to be installed. Literature shall indicate product characteristics, typical uses, performance and limitation criteria and test data. Submit cured samples of firestop materials.

B. Product Data: Shall be clearly marked to indicate all technical information which specifies full compliance with requirements of this section and Contract Documents, including the following:

1. Copy of UL illustration of each proposed system indicating manufacturer's approved modifications.
2. Each condition requiring penetration seals in proposed UL systems materials, anchorage, methods of installation and actual adjacent construction.

### 1.4. Quality Assurance

A. Firestopping systems (materials and design) shall conform to both Flame (F) ratings and Time (T) ratings as required by local building code and as tested by nationally accepted test agencies per ASTM E814 or UL 1479 fire tests in a configuration that is representative of field conditions.

### 1.5. Coordination

A. Coordinate layout and installation of Firestopping System with other trades.

B. Revise locations and elevations from those indicated as required to suit field conditions and as approved by the Architect.

## 2. PRODUCTS

### 2.1. Acceptable Manufacturers:

A. Materials and products required for work of this section shall not contain asbestos or polychlorinated biphenyls (PCB).

B. Manufacturers: 3M, STI, & Hilti

C. Firestopping System must be approved by the local AHJ before purchase or installation.

### 2.2. General

Provide and install firestopping materials to meet applicable codes and installation requirements for each firestopping application. Products using caulking, putties, wrap strips, mortars, composite boards and/or mechanical devices shall be used as appropriate for the specific condition.

### 2.3. Caulking

When caulking is used, provide and install flexible caulking materials. Cured firestop materials 1/8 thick shall be able around a 1” mandrel without breaking.

### 2.4. Firestop

Do not use any firestop products which re-emulsify, leach active intumescent ingredients or dissolve when placed in water after curing. Product must withstand the passage of cold smoke, either as inherent property of the system or by the use of a separate product included as part of the UL system or device and designed to perform this function.

### 2.5. Penetration Seals

A. General:

1. Penetration seals (firestopping material) shall be asbestos-free and capable of maintaining an effective barrier against flame, smoke, and gases in compliance with requirements of ASTM E814 and UL 1479.
2. Materials shall meet and be acceptable for use by all three model building codes, Basic/California Building Code, Building Code and Standard Building Code, per National Evaluation Service, Inc. report # NER-243.
3. Materials shall meet requirements of NFPA 101 and NFPA 70.
4. Materials shall be suitable for the firestopping of penetrations made by steel, glass, plastic and insulated pipe, conduit, bus duct, non-insulated pipe and ductwork.
5. On insulated pipe, fire-rating classification must not require removal of insulation.
6. The rating of penetration seals shall not be less than the rating of the time-rated floor or wall assembly.
7. Systems shown below are examples and other equal systems may be approved or required by the AHJ.

B. 2-hour Rated Concrete Floor:

1. Penetrants: Multiple pipes.

2. UL System: No. 93.

C. 2-hour Rated Concrete Floor:

1. Penetrants: Maximum 30” dia. Metal pipe/conduit.
2. UL System: No.319

D. 1-2 –Hour Rated Gypsum Board Wall:

1. Penetrant: Metal pipe/conduit.
2. UL System: No. 147

E. 2-Hour Rated Gypsum Board Wall:

1. Penetrant: Metal pipe/conduit.
2. UL System: No. 147.

F. 3-Hour Rated Concrete Wall:

1. Penetrant: Metal duct, maximum 2’ square and maximum dimension of 30”.
2. UL System: No. 105.

G. Walls Below Grade:

1. Penetrants: Pipe sleeves.
2. Seal: Thunderline “Link Seal” casing seal.

## 3. EXECUTION

### 3.1. Inspection

Examine the areas and condition where Firestops are to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected by the contractor in a manner acceptable to the Architect.

### 3.2. Conditions Requiring Firestopping

A. General – Provide firestopping for conditions specified whether or not firestopping is indicated, and if indicated, whether such material is designed as insulation, safing, or otherwise.

B. At any point where a fire rated wall is penetrated with cable or conduit.

C. Penetrations

1. Penetrations include conduit, cable wire, pipe, duct or other elements which pass through one or both outer surfaces of a fire rated floor, wall or partition.
2. These requirements for penetrations shall apply whether or not sleeves have been provided, and whether of not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved firestop any annular space between the sleeve and wall opening.

D. Provide firestopping to fill miscellaneous voids and openings in fire-rated construction as specified herein.

### 3.3. 3.3 Installation

A. General

1. Installation of Firestops shall be performed by an applicator/installer qualified and trained by the manufacturer. Installation shall be performed in strict accordance with manufacturer's detailed installation procedures.
2. Apply Firestops in accordance with fire test reports, fire resistance requirements, acceptable sample installations, and manufacturer's recommendations.
3. Coordinate with plumbing, mechanical, electrical, and other trades to assure that all pipe, conduit, cable, and other items which penetrate fire-rated construction have been permanently installed prior to installation of Firestop.

B. Field Quality Control

1. Prepare and install firestopping systems in accordance with manufacturer's printed instructions and recommendations.
2. Follow safety procedures recommended in the Material Safety Data Sheets.
3. Finish surfaces of firestopping which is to remain exposed in the completed work to a uniform and level condition.
4. All areas of work must be accessible until inspection by the applicable Code Authorities.
5. Correct unacceptable firestops and provide additional inspection to verify compliance with this specification at no additional cost.

C. Calculate the maximum cable fill ratio for each FireStopping System and cable type. Do not exceed the maximum fill ratio.

D. Prepare and install firestopping systems in accordance with manufacturer's printed instructions and recommendations.

## 3.4. Warranty

A. A. Comply with General Conditions, and include but not be limited to:

1. Repairs and replacement of penetration seals which fail in joint adhesion, cohesion, abrasion, resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability, or appear to deteriorate in any other manner not clearly specified in submitted manufacturer's data as an inherent quality of the material for exposure indicated.

## 3.5. Cleaning

A. Remove spilled and excess materials adjacent to firestopping without damaging adjacent surfaces.

B. Leave finished work in neat, clean condition with no evidence of spillovers or damage to adjacent surfaces.

**END OF SECTION**

# 27 05 33 Conduits and Backboxes for Communications Systems

## 1. GENERAL

### 1.1. Outlets Cat5e and Cat6

A. Each data outlet in a wall or floor shall be served by one (1) 1 in. conduits and a double-gang deep device box with a single-gang mud ring. U.O.N.

B. Wall mounted telephones shall be served by one 0.75 in. conduit and a single-gang deep device box with a single-gang mud ring. The outlet box shall be mounted at a center height of 48 in. above the finished floor, unless otherwise specified on the drawing, and shall have a clearance of 12 in. of wall surface on all sides.

C. All outlet conduits shall be stubbed into accessible ceiling space.

D. All outlet conduits shall have burrs and any other abrasive elements removed and an insulating bushing shall be installed on both ends.

E. No section of conduit shall be longer than 30 m (100 ft.) between pull points.

F. No more than 180 degrees of conduit bends shall be permitted between pull points.

G. The minimum inside radius for any bend of an outlet conduit shall be six times the inside diameter of that conduit.

### 1.2. Outlets Cat6A

A. Each data outlet in a wall or floor shall be served by one (1) 1.25 in. conduits and a 5-Square double-gang deep device box with a single-gang mud ring.

1. Approved manufactures: Steel City, Rand-L, or approved equal

B. All outlet conduits shall be stubbed into accessible ceiling space.

C. All outlet conduits shall have burrs and any other abrasive elements removed and an insulating bushing shall be installed on both ends.

D. No section of conduit shall be longer than 30 m (100 ft.) between pull points.

E. No more than 180 degrees of conduit bends shall be permitted between pull points.

F. The minimum inside radius for any bend of an outlet conduit shall be six times the inside diameter of that conduit.

### 1.3. Conduits

A. Electric metallic tubing: Comply with UL 797. Tubing shall have hot dipped galvanized exterior, enamel-coated interior.

G. Flexible conduit shall not be used in lieu of conduit bends and offsets.

H. PVC conduit: Comply with UL 651, listed for use with 90 degrees C conductors operating at 90 degrees C.

### 1.4. Standards Compliance

A. General standards: Comply with current revision of TIA 569 as amended

### 1.5. Submittals

A. Provide product data for the following:

1. Manufacturers cut sheets, specifications, and installation instructions for all products (submit with bid).

### 1.6. Coordination

A. Coordinate installation of labels with other trades.

I. Storage and Handling: Avoid breakage, denting and scoring finishes. Damaged products will not be installed. Store materials in original cartons and in a clean dry space; protect from weather and construction traffic. Wet materials will be unpacked and dried before storage.

## 2. PRODUCTS

### 2.1. Approved Products

A. Dry location device boxes: Manufacturer shall be:

1. Steel City, Rand-L, Hubbell, or Raco
Equivalent products by other manufacturers may be used where approved in writing by Owner's Representative.

J. Wet location boxes: Manufacturer shall be:

1. Steel City, Rand-L, Hubbell, or Raco
Equivalent products by other manufacturers may be used where approved in writing by Owner's Representative.

## 3. EXECUTION

### 3.1. Installation

A. Installation and configuration shall conform to the requirements of the current revision levels of California Electrical Code (CEC), ANSI/ EIA/TIA Standards 568 & 569, NFPA 70 (National Electrical Code), applicable local codes, and to the manufacturer's installation instructions.

K. Install conduits using techniques, practices, and methods that are consistent with Category 6 or higher requirements and that supports Category 6 or higher performance of completed and linked signal paths, end to end.

L. Follow manufacturer's recommendations for allowable fill capacity for each size non-continuous cable support.

**END of SECTION**

# 27 05 36 Cable Trays for Communications Systems

## 1. GENERAL

### 1.1. Scope

A. Continuous, rigid, welded steel or stainless steel wire mesh cable management system.

B. Cable tray systems are defined to include, but are not limited to, straight sections, supports and accessories.

### 1.2. Related Documents:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.3. Quality Assurance

A. Source Limitations: Obtain cable tray components through one source from a single manufacturer.

B. Comply with CEC, NFPA 70, National Electrical Code, Article 392: Cable Trays; provide UL Classification and labels.

### 1.4. Coordination

A. Coordinate layout and installation of cable tray with other trades.

B. Revise locations and elevations from those indicated as required to suit field conditions and as approved by the Architect.

## 2. PRODUCTS

### 2.1. Manufacturers

A. Subject to compliance with requirements, provide products by the following:

### 2.2. Materials and Finishes:

A. Cable Tray Materials:

Carbon steel wire, ASTM A 510, Grade 1008. Wire welded, bent, and surface treated after manufacture.

B. Cable Tray Finishes:

Finish for Carbon Steel Wire after welding and bending of mesh;

1. Electrodeposited Zinc Plating: ASTM B 633, Type III, SC-1.
2. Powder-Coated Trays – UL classified Black powder-coated surface treatment over Electrodeposited Zinc Plating (or plain steel) using ASA 61 black polyester coating.

C. Cable tray will consist of continuous, rigid, welded steel wire mesh cable management system, to allow continuous ventilation of cables and maximum dissipation of heat, with UL Classified splices where tray(including UL Classified painted tray) acts as Equipment Grounding Conductor (EGC). Wire mesh cable tray will have continuous Safe-T-Edge T-welded top side wire to protect cable insulation and installers.

D. Provide splices, supports, and other fittings necessary for a complete, continuously grounded system.

Mesh: 2 x 4 inches (50 x 100 mm).
Straight Section Lengths: 118 inches (3,000 mm).
Wire Diameter: Patented design includes varying wire sizes to meet application load requirements; to optimize tray Strength; and to allow tray to remain lightweight.
Safe-T-Edge: Patented Safe-T-Edge technology on side wire to protect cable insulation and installers' hands.
Fittings: Wire mesh cable tray fittings are field-fabricated from straight tray sections, in accordance with manufacturer's instructions and Item 2.3.

E. CF Series Cable Tray Size:

1. Depth: Cable tray depth will be 4 inches
2. Width: Cable tray width will be 6 ,12, 18, or 24 inches as shown on Telecommunications Drawings:
3. Length: Cable tray section length will be 118 inches (3000mm) unless otherwise shown on drawings.
4. Fill Ratio: Cable tray may be filled to total fill capacity per CEC. Minimum 20% spare capacity recommended to accommodate future cabling changes or additions.
5. Load Span Criteria:
6. Cable tray will be capable of carrying a uniformly distributed load of 50 pounds per foot on an 8 ft support span, according to load tests of standard shown in Item A above.

## 2.3. Cable Tray Supports & Accessories

A. Fittings/Supports: Wire mesh cable tray fittings are field-fabricated from straight tray sections, in accordance with manufacturer's instructions. Supports will include the FAS (Fast Assembly System) where possible so that screws, bolts, and additional tools are not required for cable tray mounting; installation time is reduced; and tray path can adapt to installation obstacles without the need for additional parts. Place supports so that support span does not exceed that shown on the drawings.

1. FAS System support methods to mount from ceiling and wall structures with 1/4", 3/8" or 1/2" threaded rod, if applicable
2. Splices, including those approved for electrical continuity (bonding), as recommended by cable tray manufacturer. Select one of the following splicing methods, if applicable:
   a. UL Classified EDRN Fast Splice: No hardware required
   b. UL Classified SWK Splice Washer Kit: Swaged set for splicing, turns, bends, tees
   c. UL Classified ED Universal Splice Bar: Cut & bend to fit any configuration
   d. Preclick Splice: Bolted connection optional

e. UL Classified EDT Splice Plate: Bolted connection
f. UL Classified CE 25 & CE 30 Square Splice Washers: Use with EZ BN ¼" Nut & Bolt
g. UL Classified CE 40 Square Splice Washer: Use with EZ BN ¼" to splice trays on bends, adjustable tees
h. FASLock Splice: For sweeps and bends with tray 12" (300mm) and wider.
i. UL Classified EZ T 90 kit: For Tees and 90s
j. UL Classified RADT90 kit: For 5-1/2" radius Tees and 90s

A. Accessories: As required to protect, support, and install a cable tray system. Select from the following accessories, if applicable:

### 2.4. Equipment Grounding Conductor Function & Grounding

A. UL Classified cable trays (including painted tray) may act as Equipment Grounding Conductors.

B. Use UL Classified splicing methods to ensure cable tray is electrically continuous and bonded as recommended.

Ground cable trays at end of continuous run.

C. Test cable tray system per NFPA70B, Chapter 18 to verify grounding less than 1 ohm.

D. Ground cable trays against fault current, noise, lightning, and electromagnetic interference by mounting grounding wire to each 10' cable tray section with grounding clamp.

## 3. EXECUTION

### 3.1. Examination:

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of cable trays. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2. Installation

A. Install cable tray level and plumb according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.

B. Cutting: Field-fabricate changes in direction & elevation by cutting & bending cable tray.

1. Cut cable tray wires in accordance with manufacturer's instructions.
2. Cable tray wires must be cut with side-action bolt cutters with offset head to ensure integrity of protective galvanic layer.
3. Remove burrs and sharp edges from cable trays.

**END of SECTION**

## 27 05 43 Underground Ducts and Raceways for Communications Systems

A. Outdoor telecommunications pathways connect building, pedestals, maintenance holes, handholds, and towers. These pathways consist of underground, direct-buried or aerial. Underground or direct-buried are generally preferred over aerial because of aesthetics and security. Generally, underground duct banks are preferred over direct-buried because of security, ease of future cable installation and maintenance.

C. Conduit Types

Examples of conduit types include:
— EB-20 – For encasement in concrete;
— EB-35 – For encasement in concrete;
— DB-60 – For direct burial or encasement in concrete;
— DB-100 – For direct burial or encasement in concrete;
— DB-120 – For direct burial or encasement in concrete;
— Rigid Nonmetallic Conduit Schedule 40 – For direct burial or encasement in concrete;
— Rigid Nonmetallic Conduit Schedule 80 – For direct burial or encasement in concrete;
— Multiple Plastic Duct (MPD) – For direct burial or installation in conduit;
— Rigid Metallic Conduit – For direct burial or encasement in concrete;
— Intermediate Metallic Conduit – For direct burial or encasement in concrete;
— Fiberglass Duct – For direct burial or encasement in concrete;
— Innerduct Polyethylene (PE) – For direct burial or installation in conduit;
— Innerduct Polyvinyl Chloride (PVC) – For direct burial or installation in conduit

D. Installation

1. The length of conduit between pulling points shall not exceed 600 ft (183m).
2. Manufactured bends should be used whenever possible. No section of conduit shall contain more that two 90-degree bends, or equivalent between pull points.
3. Conduits should be installed such that a slope exists to allow drainage and prevent the accumulation of water.
4. When conduits connect maintenance holes, a slope of .125 in per foot (10 mm per meter) should exits from the middle of the span to each maintenance hole.
5. Conduits must be buried at a minimum depth of 18 in. (45.7 cm).

**END of SECTION**

# 27 05 53 Identification for Communications Systems

## 1. GENERAL

### 1.1. Work Includes

A. Work covered by this Section shall consist of furnishing labor, equipment, and materials necessary for the labeling of the telecommunications infrastructure as described on the Drawings and/or required by these specifications.

### 1.2. Scope of Work

A. This Section includes the minimum requirements for the Identification and labeling of the Communications Systems for the project as outlined in the Bid Document.

### 1.3. Summary

A. Administration of the telecommunications infrastructure includes documentation of cables, termination hardware, patching and cross-connection facilities, conduits, other cable pathways, Telecommunications Rooms, and other telecommunications spaces. All facilities shall apply and maintain a system for documenting and administering the telecommunications infrastructure.

B. Industry Labeling Standards and Conventions shall be used unless otherwise stated in the bid documents or by the Owner's Representative.

C. Telecommunications Infrastructure Records must be maintained in a computer spreadsheet, or in a computer database. Paper records are encouraged but are optional. A cable record is prepared for each backbone cable. The record will show the cable name and must describe the origin point and destination point of the cable. The cable record will record what services and/or connections are assigned to each cable pair or strand. An equipment record is prepared for services distributed from a certain piece of equipment, such as a router, or a system such as the telephone system PBX.

D. Installer shall maintain accurate, up-to-date Installation or Construction Drawings. At a minimum, the Installation Drawings shall show pathway locations and routing, configuration of telecommunications spaces including backboard and equipment rack configurations, and wiring details including identifier assignments.

E. Installer shall provide a complete and accurate set of as-built drawings. The as-built drawings shall record the identifiers for major infrastructure components including; the pathways, spaces, and wiring portions of the infrastructure which may each may have separate drawings if warranted by the complexity of the installation, or the scale of the drawings.

### 1.4. Quality Assurance

A. All labels shall be installed in a neat and workmanlike manner. All methods of labeling that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner or Owner Representative.

B. Labels shall be of the quality and manufacture indicated. The labels and labeling equipment specified are based upon the acceptable manufacturers listed. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

C. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices when installing communications/data labeling.

## 2. PRODUCTS

### 2.1. Labels

A. Shall be preprinted or computer printed type. Handwritten labels are not acceptable.

B. Where insert type labels are used provide clear plastic cover over label.

C. Outside plant labels shall be totally waterproof even when submerged.

## 3. EXECUTION

### 3.1. Identification & Labeling

A. The size, color, and contrast of all labels should be selected to ensure that the identifiers are easily read. Labels should be visible during the installation of and normal maintenance of the infrastructure.

B. Labels should be resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and should have a design life equal to or greater than that of the labeled component.

C. All labels shall be printed or generated by a mechanical device.

### 3.2. Telecommunication Identifiers

A. Outside Plant cabling shall be clearly marked using permanent means. Outside plant shall use the following system of numbering and labeling:

1. Fiber Optic:
   a. Identify: far-end building name, building number, fiber-type and strand-count
   b. Label at entrance and exit points of tunnel system and at conduit entry points between 12 inches and 36 inches from the conduit or at closet point that is clearly visible and long cable length in tunnel at 200 foot intervals.
   c. Label at termination panels at both ends.
2. Copper:
   a. Identify: far-end building name, building number and strand-count
   b. Label at entrance and exit points of tunnel system and at conduit entry points between 12 inches and 36 inches from the conduit or at closet point that is clearly visible and long cable length in tunnel at 200 foot intervals.

B. Riser cabling shall be clearly marked using permanent means. Riser cabling shall use the following system of numbering and labeling:

1. Fiber Optic:
   a. Identify: far-end EF / ER / TR, fiber-type and strand-count .
   b. When small facilities are fed from a primary location and treated as an ER, riser shall be labeled like Outside Plant Fiber Optic.
2. Copper:
   a. Identify: far-end EF / ER / TR and pair-count
   b. Termination points shall be labeled as to actual pair at every fifth (5th) pair-point.

## 3.3. Labeling Procedures

A. To be consistent with ANSI/TIA/EIA standards and industry practices, it is important that both labeling and color coding be applied to all telecommunications infrastructure components. Labeling with the unique identifier will identify a particular component. Proper color coding will quickly identify how that component is used in the overall telecommunications infrastructure of the facility.

B. Visibility and durability:

1. The size, color, and contrast of all labels should be selected to ensure that the identifiers are easily read. Labels should be visible during the installation of and normal maintenance of the infrastructure.
2. Labels should be resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and should have a design life equal to or greater than that of the labeled component.
3. Labels are generally of either the adhesive or insert type. All labels must be legible, resistant to defacement, and maintain adhesion to the application surface.
4. Outside plant labels shall be totally waterproof, even when submerged.
5. Labels applied directly to a cable shall have a clear vinyl wrapping applied over the label and around the cable to permanently affix the label.
6. Other types of labels, such as tie-on labels, may be used. However, the label must be appropriate for the environment in which it is used, and must be used in the manner intended by the manufacturer.

C. Mechanical generation

1. All labels shall be printed or generated by a mechanical device.
2. Handwritten labels are NOT acceptable.

**END of SECTION**

# 27 10 00 Structured Cabling System

## 1. GENERAL

### 1.1. Related Documents

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. Division-26 & 27, Basic Materials and Methods sections apply to work specified in this section.

### 1.2. Scope of Work

A. The extent of telephone/data system work is indicated and is hereby defined to include, but not be limited to cable, cable supports, raceway, connectors, racks, cabinets, panels, wire management, device plates, patch cords, backboard, grounding, firestop and miscellaneous items required for a complete, tested and operational system.

B. Provide, install and test the complete cable and outlet system as indicated and described herein. Work includes procurement, project management, installation, labeling, termination, testing and cleanup of all cables installed under this project.

C. Provide system testing, as-builts (redlines) of installed cables and numbering plan, Operations & Maintenance Manuals (O&M's), and processing of warranty registration with Manufacturer.

D. Project coordination with General Contractor, Owner, Owners Representative, and other trades before, during and upon completion of project as necessary for a well-executed project.

E. Refer to other Master Division sections, bid proposal and project responsibilities matrix for responsibility and requirements for raceways, boxes and fittings, wiring devices (plates), and supporting devices, and other sections, as applicable.

F. Horizontal cabling may contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.

G. Bridged taps and/or splices will not be installed in the horizontal cabling.

H. Communications cables shall be rated CMR or CMP. CMP cable ratings are required for cables passing through or contained within plenum air handling spaces, such as above drop ceilings and return or supply air shafts. The contractor is responsible for installing the correct cable type in the appropriate environment, and any failures to do so according to the Owner or the Authority Having Jurisdiction (AHJ) will result in the contractor removing the unsuitable cable and installing the correct cable, at their own expense.

I. The maximum allowable horizontal cable length installed in the permanent link (jack to jack) is 295 feet (90 m). This maximum allowable length does not include an allowance for patch cords, maximum length of 16 feet (5 m) to the workstation equipment and of 16 feet (5 m) in the horizontal cross-connect.

## 1.3. References

A. ANSI/TIA-492.AAAC-B – Detail Specification for 850-nm Laser-Optimized, 50-um Core Diameter/125-um Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers

B. ANSI/TIA-492.AAAD – Detail Specification for 850-nm Laser- Optimized, 50-µm Core Diameter/125-µm Cladding Diameter Class la Graded-Index Multimode Optical Fibers Suitable for Manufacturing OM4 Cabled Optical Fiber

C. ANSI/TIA-492.CAAB – Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak. Current Edition

D. ANSI/TIA-568.0-D – Generic Communications Cabling for Customer Premises

E. ANSI/TIA-568.1-D – Commercial Building Communications Cabling Standard

F. ANSI/TIA-568-C.2-1 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards

G. ANSI/TIA-568.3-D – Optical Fiber Cabling and Components Standard

H. ANSI/TIA-569-D – Telecommunications Pathways and Spaces

I. ANSI/TIA-606-B.1 – Administration Standard for the Commercial Telecommunications Infrastructure.

J. ANSI/TIA-607-C – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

K. ANSI/TIA-862-B – Structured Cabling Infrastructure Standard for Intelligent Building Systems

L. ANSI/TIA-942-A – Telecommunications Infrastructure Standard for Data Centers

M. NFPA 70 – National Electrical Code (NEC). Current edition at time of bid.

N. BICSI – TDMM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDMM)

## 1.4. Quality Assurance

A. Contractor shall assign competent person as project manager who has demonstrated the ability to supervise a project of similar size and scope. Submit a resume of the proposed Project Manager for the District's review and acceptance. The Project Manager must attend meetings as required.

B. Use adequate numbers of skilled workers thoroughly trained and experienced on the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

C. The system Contractor shall warrant any equipment installed under this specification to be free from defect for a period of one (1) year from the date of final acceptance.

D. The contractor shall certify completion in writing and schedule the commissioning walk-through. The contractor shall provide all the tools and personnel needed to conduct an efficient commissioning process.

E. The contractor shall coordinate with the commissioning staff and schedule appropriate walk through and testing. Testing is outlined in section 3.2 Tests and Instruction.

F. Comply with applicable portions of CEC/NEC as to type products used and installation of components. Provide products and materials, which have been UL-listed and labeled. Comply with NEMA, ANSI and TIA standards manufacturer's recommendations for horizontal cabling.

## 1.5. Warranty

A. The system Contractor shall warrant any equipment installed under this specification to be free from defect for a period of one (1) year from the date of final acceptance.

B. A Manufactures Limited Lifetime Product & Performance Warranty covering all components, equipment and workmanship shall be provided to the Owner, submitted in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1. Horizontal channels shall be completed with Leviton Network Solutions factory-terminated copper and/or fiber optic patch cords in order to be eligible for the applicable Leviton Warranty with channel performance guarantees.

2. Approved product shall be listed on the most recent version of the applicable Leviton data sheets for each listed Berk-Tek Leviton Technologies solution.

3. The Contractor must pre-register the project with the Manufacturer before installation has begun. Following project completion, contractor is responsible for completing all warranty registration procedures on behalf of the Owner.

4. Should the cabling system fail to perform its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the contractor shall promptly make all required corrections without cost to the owner.

C. Certified Installer shall provide labor, materials, and documentation in accordance with Leviton Network Solutions requirements necessary to ensure that the Owner will be furnished with the maximum available Manufacturer’s Warranty in force at the time of this project.

D. The installed structured cabling system shall provide a warranty guaranteeing the specified performance in the installed channel performance above the ANSI/TIA-568 requirements for Augmented Category 6 (CAT 6A) cabling systems or ISO 11801 requirements for Class EA.

1. Standards-compliant channel or permanent link performance tests shall be performed in the field with a Leviton-approved certification tester in the appropriate channel or permanent link test configuration.

E. Necessary documentation for warranty registration shall be provided to the manufacturer by the installer (within 30 days) following 100 percent testing of cables.

1. Installation Contractor shall submit test results to Leviton Network Solutions in the certification tester’s original software files.

2. Installation Contractor shall ensure that the warranty registration is properly submitted, with all required documentation within 30 days of project completion.

3. Certified Contractor/Integrator must adhere to the terms and conditions of the respective manufacturer's warranty programs.

F. Manufacturer shall ensure that the Owner receives the project warranty certificate within 60 calendar days of warranty registration.

### 1.6. Submittals and Substitutions

A. REFER TO SUBMITTAL SECTION 013300 FOR REQUIREMENTS.

B. Provide product data for the following:

1. Manufacturers cut sheets, specifications and installation instructions for all products.

C. The Owner has standardized on a unified, end-to-end copper and optical fiber cabling system design based on Leviton jacks, patch panels, patch cords, fiber cords, fiber connectors, trunk cables, fiber enclosures and modules, as well as Berk-Tek field-terminable copper and fiber cables.

D. Subject to compliance with requirements, provide products of the following:

1. Leviton Manufacturing Co, Inc.

2. Berk-Tek, a Nexans Company

3. Pre-approved equal (Belden, Panduit, Commscope-Systimax)

E. Any substitutions must be approved by Designer, Owner and/or Owner's Representative in writing prior to acceptance of bid.

F. Products which are proposed in the bid response which are of an alternative solution are to be prequalified as "equal or better" by the Designer and Owner, in writing, prior to bid acceptance. If substitutions are allowed, they are at the discretion of the Owner and based on performance, suitability, quality, administrational requirements, warranty and other factors deemed important to the Owner. Written acceptance of substitutions from Owner must be included in bid package to avoid disqualification of bid.

G. Submit manufacturer's data and installation details for all devices, plates, cable, terminal blocks, patch cords, racks, wire management, labels and similar equipment which are not in accordance with Owner standards.

## 2. PRODUCTS

### 2.1. General

A. The UTP cabling system will have TIA/EIA T568B pin/pair termination assignment. All conductors provided will be properly and consistently terminated at both ends throughout the entire systems. Maintain proper untwist of pairs and removal of jacket per TIA, BICSI, and Manufacturer's recommendations.

## 2.2. Copper Cabling

A. Category 6A (CAT6A) Unshielded Twisted Pair (UTP) Systems

1. Category 6A 23AWG UTP copper cabling system shall be guaranteed to exceed all TIA-568 link and channel performance requirements and be capable of supporting 10G Base-T (802.3an) and ISO/IEC 11801 Class EA applications for a total distance of 100 meters with equipment cords. System is guaranteed to meet all CAT6A requirements for short links and channels down to a 10 foot link (5 meter channel) with a guaranteed 5 dB margin of Alien Crosstalk. Field testing is not required for Alien Crosstalk clearance.
2. Basis of Design is Berk-Tek Leviton Technologies CX6850 Cat6A Premium UTP System.
3. Category 6A (CAT6A) Unshielded Twisted-Pair (UTP) cable
    a. 100-Ohm, 23 AWG, Category 6A 4-pair balanced unshielded twisted pair solid annealed copper
    b. Cable shall be characterized to 750 MHz and UL/ETL Listed by the Manufacturer printed on the cable jacket and package, as well as Intertek (ETL) Verified to TIA-568 Category 6A and ISO/IEC 11801 Class EA requirements for channel, link and component performance to support IEEE 10GBASE-T (802.3an) networks
    c. Maximum Cable Outer Diameter: 0.275”.
    d. Documentation available from an independent third-party testing agency that verifies through random sampling that cable components perform at or above the levels contained on their product specifications, not simply at or above the standard.
    e. Guaranteed cable balance improves overall performance and reduces emissions which results in error-free performance up to 10 Gigabit Ethernet with full duplex transmission
    f. The unshielded twisted pair conductors are surrounded by a non-conductive aluminum/polyester tape and jacketed with flame-retardant polymer alloy to reduce alien crosstalk, reduce cable diameter and improve performance.
    g. Provided on spools or reels-in-box to reduce risk of kinking cable upon deployment
    h. Cable shall be Plenum-rated (CMP) for any location where plenum cable is required.
    i. Color: Blue, or as directed.
    j. Be made by an ISO 9001 and 14001 Certified Manufacturer.
    k. Guaranteed to meet or exceed Channel margin guarantees as stated above under System Performance
4. Approved Products:
    a. Berk-Tek LANmark XTP, CAT6A CMP, Blue, 1000’ reel, # 11082057

b. Berk-Tek LANmark XTP, CAT6A CMR, Blue, 1000’ reel, # 11082062

B. CAT6A Shielded (F/UTP, or FTP) Systems

1. Horizontal FTP Category 6A 23AWG copper cabling system shall be guaranteed to exceed all TIA-568-C.2 link and channel performance requirements and be capable of supporting 10G Base-T (802.3an) and ISO/IEC 11801 Class EA applications for a total distance of 100 meters with equipment cords. System is guaranteed to meet all Cat 6A requirements for short links and channels down to a 10 foot link (5 meter channel) with a guaranteed 4 dB margin of Alien Crosstalk. Field testing is not required for Alien Crosstalk clearance.

2. Basis of Design is Berk-Tek Leviton Technologies CS6700 CAT6A Shielded System.

3. Category 6A (CAT6A) Shielded, or Foiled Twisted Pair (FTP) cable

a. 100-Ohm, 23 AWG, Category 6A 4-pair balanced twisted pair solid annealed copper with a single overall foil shield.

b. Shielded with an overall polyester/aluminum foil with stranded tinned copper drain wire and ripcord and jacketed in flame-retardant PVC

c. Characterized to 750 MHz, 75ºC and UL/ETL Listed by the Manufacturer printed on the cable jacket and package, as well as Intertek (ETL) Verified to TIA-568 Category 6A and ISO/IEC 11801 Class EA requirements for channel, link and component performance to support IEEE 10GBASE-T (802.3an) networks

d. Maximum Cable Outer Diameter: 0.280”.

e. Documentation available from an independent third-party testing agency that verifies through random sampling that cable components perform at or above the levels contained on their product specifications, not simply at or above the standard.

f. Guaranteed cable balance improves overall performance and reduces emissions which results in error-free performance up to 10 Gigabit Ethernet with full duplex transmission

g. Provided on spools to reduce risk of kinking cable upon deployment

h. Cable shall be Plenum-rated (CMP) for any location where plenum cable is required.

i. Color: White, or as directed.

j. Be made by an ISO 9001 and 14001 Certified Manufacturer.

k. Guaranteed to meet or exceed Channel margin guarantees as stated above under System Performance

4. Approved Products:

a. Berk-Tek LANmark-10G FTP, CAT6A CMP, White, 1000’ reel, # 10167485

b. Berk-Tek LANmark-10G FTP, CAT6A CMR, White, 1000’ reel, # 10189801

C. Category 6 (CAT6) Unshielded Twisted Pair (UTP) Systems

1. Category 6 UTP 23AWG copper cabling system shall be guaranteed to exceed all TIA-568 link and channel performance requirements and be capable of supporting 1000Base-T (802.3ab) and ISO/IEC 11801 Class E applications for a total distance of 100 meters with equipment cords.
2. Basis of Design is Berk-Tek Leviton Technologies CX6175 CAT6 UTP System.
3. Category 6 (CAT6) Unshielded Twisted-Pair (UTP) cable
    a. 100-Ohm, 23 AWG, Category 6 4-pair balanced unshielded twisted pair solid annealed copper conductors
    b. Cable shall be characterized to 550 MHz and UL/ETL Listed by the Manufacturer printed on the cable jacket and package, as well as ETL Verified to TIA-568 Category 6 and ISO/IEC 11801 Class E.
    c. Cable shall be Plenum-rated (CMP) for any location where plenum cable is required.
    d. Color: Blue, or as directed.
    e. Outer Diameter: 0.230” max.
    f. Cable shall be guaranteed to exceed all TIA-568 link and channel performance requirements and be capable of supporting 1000Base-T (802.3ab) and ISO/IEC 11801 Class E applications for a total distance of 100 meters with equipment cords
4. Approved Products:
    a. Berk-Tek LANmark 1000, CAT6+ UTP, Blue, CMP, 1000’ box, # 10032094
    b. Berk-Tek LANmark 1000, CAT6+ UTP, Blue, CMR, 1000’ box, # 10032455

## 2.3. Copper Connectivity

A. Category rated data connectors (RJ45 jacks)

1. Provide mission-critical, modular-type, information connectors/outlets (jacks) for 24-23 AWG copper cable. These connectors shall be individual snap-in style, and exceed compliance with TIA-568 specifications. The connectors shall comply with the following:
    a. Shall be 8-position 8-conductor (8P8C) “RJ45”-style modular jack, Category 6 (CAT6) and/or Category 6A (CAT6A), with IDC terminals, T568A/B wiring scheme (use T568B), and utilize a non-punchdown simplified manual termination style.
    b. Shall be encased in a die-cast housing to protect from potential EMI/RFI, and utilize a universal Keystone-style insertion footprint as the manufacturer’s main “flagship” line of products.
    c. CAT6A connectors shall exceed all component performance requirements for Augmented Category 6 in the ANSI/TIA-568 standard, as well as Class EA requirements as described in ISO/IEC 11801, from 1 MHz to 500 MHz to support the IEEE 802.3an standard for 10GBASE-T network performance.

d. CAT6 Connectors shall exceed all component performance requirements for Category 6 in the ANSI/TIA-568-C.2 standard, as well as Class E requirements as described in ISO/IEC 11801, from 1 MHz to 250 MHz.

e. Shielded connectors shall utilize the same form factor, design, and tool-less installation process as the unshielded connectors in the product line.

f. Shall be tested by an Independent testing body such as Intertek (ETL) for component compliance (i.e. “Component rated”) to ANSI/TIA-568 and for POE+ applications. Test results shall be published and publicly available without special request.

g. Shall be in compliance will all National Electrical Codes; compliant with ANSI/TIA-1096-A (formerly FCC Part 68); cULus Listed.

h. When used in the plenum spaces, shall be plenum-rated per UL 2043, and all plastic components shall be made of high-impact, fire-retardant plastic rated UL 94V-0.

i. Shall have a maximum depth of 1.31”.

j. Cable shall be terminated by the use of a snap-on wire manager that holds individual conductors in place during termination, and allows for termination without a complete untwist of each conductor pair. Cables shall terminate onto jack via a “clamshell” closure at rear of connector, affixing termination manager to connector IDC

k. Shall be terminated without the need for any punch down tool or other specialized or proprietary termination tool.

l. Shall be reusable and support a minimum 20 termination and re-termination cycles and be facilitated by simple termination release levers.

m. Shall utilize a method of tine tensioning using polymer springs above the tines (“Retention Force Technology” or similar functionality) that prevents six-position modular plug insertion from damaging either the cord or the module and promotes return of tines to original position.

n. Shall fit the full manufacturer’s range of telecommunications faceplates, outlets, and field-configurable patch panels. No separate product line or style of connectors shall be required for patch panels, faceplate, biscuit, furniture, raceway and/or floor feed applications.

o. Shall be available in 13 TIA 606-B compatible colors and supplied with interchangeable icons (Voice, Data, A/V, and blank, color coded to match the connector face) for easy identification and tracking of data, voice, or other functions. Additional bulk Icons for the connector shall be available separately.

p. Shall be available with an optional internal shutter to protect against dust and debris such as in above-ceiling and in-floor locations.

2. Approved Products:

a. Leviton Atlas-X1 UTP Cat 6A Connector, no shutters, 6AUJK-R*6

b. Leviton Atlas-X1 UTP Cat 6A Connector, with shutters, 6AUJK-S*6

c. Leviton Atlas-X1 STP (Shielded) Cat 6A Connector, no shutters, 6ASJK-R*6

d. Leviton Atlas-X1 STP (Shielded) Cat 6A Connector, with shutters, 6ASJK-S*6

e. Leviton Atlas-X1 UTP Cat 6 Connector, no shutters, 61UJK-R*6

f. Leviton Atlas-X1 UTP Cat 6 Connector, with shutters, 61UJK-S*6

g. Additional Icons: ICONS-IC* (72 two-sided Icons)

Where * = one of 13 colors. See drawings or check with Owner for application.

(W)=White, (T)=Light Almond, (A)=Almond, (I)=Ivory, (Y)=Yellow, (O)=Orange, (L)=Blue, (B)=Brown, (C)=Crimson, (R)=Dark Red, (P)=Purple (V)=Green, (G)=Grey, (E)=Black

B. Copper patch panels

1. Telecommunications Room Patch panels shall be manufactured with empty ports, which allow for the insertion of appropriately-graded and colored jacks. Panels shall be Shielded, standard density, and used for all CAT6 and CAT6A terminations at IDF and MDF locations. Panels shall be:

a. Unshielded for UTP, and Shielded for either FTP or UTP applications, and shall accept both styles (UTP/FTP) of jacks in the same panel. Shielded panels shall include star washers and grounding lug for flexibility in panel grounding, and/or hardware to accept standards-compliant grounding connectors.

b. Available in either 24- or 48-ports.

c. Independently tested and verified by Intertek (ETL) to meet or exceed all TIA component, permanent link, and channel requirements of TIA-568 for Cat 5e, Cat 6, and Cat 6A, FCC part 68, and IEC 60603-7. An appropriate cable management bar shall be included with standard density flat panels.

d. QuickPort High-Density modular panels shall be available in 48-ports/1RU form factors for authorized situations.

e. Shall be sized to fit an EIA standard, 19 inch relay rack and hole pattern.

f. Shall utilize a universal Keystone-style insertion footprint as the manufacturer's main "flagship" line of products and receive the same jacks as are used in the workstation outlets. No special "Panel jack" shall be required.

2. Approved Products:

a. Leviton QuickPort Shielded Flat Patch Panel # 4S255-*xx

b. Leviton QuickPort Flat UTP Patch Panel # 49255-H24 (1RU) or 49255-H48 (2RU)

c. Leviton QuickPort Flat UTP 1RU 48-port Patch Panel # 49255-Q48

Where: xx = # of ports per panel, * = S (Shielded), H (24 ports per RU), D (48 ports per RU)

C. Faceplates

1. Faceplates (wallplates) secure information outlets to the work area. Contractor shall provide and install single gang faceplate kits to house all jacks as required for all work area outlets, workstation base feeds, and furniture openings. Unused telecom backboxes shall receive a solid blank faceplate. Telecommunications faceplates shall:
    a. Utilize a keystone-type (“QuickPort”) footprint to match the approved connectivity manufacturer, and be made by the same manufacturer as the connectors.
    b. Precisely match colors and materials of the power wiring device plates.
    c. Support any connectivity media type, including fiber, AV and copper applications.
    d. Have write-on or printable designation labels for circuit identification together with a clear plastic cover.
    e. Be available in single-gang and double-gang configurations.
    f. Have surface-mount boxes and standoff rings available for both single and double gang faceplates.
    g. Have single-port matching color blank inserts available in packs of 10.
    h. Color shall match nearby electrical devices exactly. Off-color ivories or whites will not be accepted.
    i. Furniture faceplates shall fit existing knockouts for telecom receptacles, and snap in without screw mounts.
2. Approved Products:
    a. Leviton QuickPort Single-Gang, Plastic, with ID Windows, # 42080-#xS
    b. Leviton QuickPort Single-Gang, Stainless Steel, with ID Windows, # 43080-1L#
    c. Leviton QuickPort Blank Inserts, pack of 10, #41084-BxB
    d. Leviton QuickPort Single-Gang Stainless Steel Wall Phone faceplate, #4108W-0SP
    e. Leviton Blank Plate #zz014 (1-gang), xx025 (2-gang)
    f. Leviton Extended-Depth Furniture Faceplate, #49910-Ex4

Where: # = number of ports: 2, 4, 6, x = color: White (W), Ivory (I), Light Almond (T), Gray (G), Black (E) zz= 88 (White), 77 (Lt. Almond), 86 (Ivory), 88 (Stainless Steel)

D. Surface mount boxes

1. Surface-Mount Boxes are used to protect terminated CAT6 and CAT6A cables at the endpoints where they are not contained within walls or furniture. Example locations may be Wireless Access Points (WAPs), Group Work Areas fed by conduits run down columns, security cameras, or other network-enabled device locations.
2. Ceiling, WAP, Camera and other non-wall mount locations will use a 2-port box.

3. Small Surface-Mount Boxes shall exhibit the following characteristics:
    a. Outlet housings for WAPs and other devices shall be a high-density, low profile design with (2) or (4) field-configurable ports, snap-lock cover, and cable knockouts on back.
    b. Housing cover shall have raceway knockouts for top and bottom entry. Base shall include Tie-wrap anchor points at all cable entrances.
    c. The housing shall be mountable with screws, tape or a single magnet.
    d. The cover shall provide the option of securing it to the base with a screw that is hidden under the outlet identification window.
    e. Shall be constructed of high-impact self-extinguishing plastic rated UL 94V-0, and be UL Listed and compliant with FCC Part 68 and TIA-568 specifications.
4. Approved Products:
    a. Leviton QuickPort Surface-mount Housing, White, #41089-#xP
5. Where: # = number of ports: 1, 2, 4, 6, x = color: White (W), Ivory (I), Light Almond (T), Gray (G), Black (E)

E. Copper Patch Cables
1. Copper patch cords for CAT6A UTP and FTP cable systems shall exhibit the following characteristics:
    a. Patch cord plug shall be a Slimline, integrated snag-less plug design made of industry standard, FCC compliant 94V-0 clear material without incorporating the use of a rubber molded overboot.
    b. A narrow profile for less congestion in higher density applications and a clear plastic strain relief boot ensures long-term network performance.
    c. Cable construction provides excellent alien crosstalk suppression and EMI/RFI protection.
    d. Constructed of shielded 26 AWG stranded conductor cable for maximum flexibility and outside diameter of .240”, for use in shielded and unshielded systems.
    e. Patch cords in Plenum areas shall be Plenum-rated and utilize solid conductors.
    f. Complies with TIA 568-C.2-10 component requirements for connecting hardware from 1 MHz to 500 MHz, ISO 11801 Class EA, IEEE 802.3an to support 10GBASE-T networks and cULus listed. Patch cords shall meet ANSI/TIA-1096-A requirements to include 50 micro inches of gold plating.
    g. The patch cords shall be available in standard 3, 5, 7, 10, 15, and 20 foot lengths. Custom lengths from 1’ and above shall also be available through a made to order program.
    h. The patch cord shall be available in 7 standard colors.
2. Standard copper patch cords for CAT6 UTP user locations shall exhibit the following characteristics:

a. 26-gauge, unshielded, twisted pair, stranded conductor construction with a standard 8-position modular plug on both ends.

b. Plug contacts shall be plated with minimum of 50 micro-inches (µm) of gold

c. Slimline, integrated snag-less molded plug design with integrated strain relief, without incorporating the use of any secondary or 2-piece rubber over-boot.

d. Maximum Outer Diameter of 0.24”

e. Power over Ethernet (PoE and PoE+) compatible

f. Support 1 Gigabit applications over 90-meter permanent links with up to 10 meters of cordage

g. Meets all applicable standards and listings: ANSI/TIA-1096-A (formerly FCC Part 68), RoHS compliant, IEEE 802.3, PoE: IEEE 802.3at – 2012

h. Color: White

3. High-flex copper patch cords for CAT6 UTP cable systems used inside Telecom Enclosures, Rooms and racks shall exhibit the following characteristics:

a. 28-gauge, unshielded, twisted pair, stranded conductor construction with a standard 8-position modular plug on both ends.

b. Plug contacts shall be plated with minimum of 50 micro-inches (µm) of gold

c. Slimline, integrated snag-less molded plug design with integrated strain relief, without incorporating the use of an secondary or 2-piece boot.

d. Ultra narrow, highly flexible cord for less congestion in higher density applications

e. Maximum Outer Diameter of 0.15”, minimum bend radius 0.60”

f. Power over Ethernet (PoE and PoE+) compatible

g. Support 1 Gigabit applications over 90-meter permanent links with up to 6 meters of cordage

h. Meets all applicable standards and listings: ANSI/TIA-1096-A (formerly FCC Part 68), RoHS compliant, IEEE 802.3, PoE: IEEE 802.3at – 2012

i. Color: White

j. To be used at patch panel end of any CAT6 permanent link.

4. Provide and install only factory-assembled patch cords of the same or better Category rating of the permanent link cabling system, in quantities as described in Part 3 of this Specification.

5. Approved Products:

a. Leviton Slimline Atlas-X1 CAT6A Component-rated Patch Cord, Blue, # 6AS10-xx*

b. Leviton Plenum-rated CAT6A Component-rated Patch Cord, Blue, # UAPPP-xx*

c. Leviton Slimline eXtreme CAT6 Component-rated Patch Cord, White, # 6D460-xx*

d. Leviton High Flex 1G HD6 Patch Cord, for CAT6 systems, White, # 6H460-xx*

6. Where: xx = Length, in Feet. * = one of 13 colors. (W)=White, (Y)=Yellow, (L)=Blue, (R)= Red, (G)=Green, (S)=Slate Grey, (E)=Black

## 2.4. Backbone Cabling

A. General

1. Copper cables allowed for use in the backbone include: 4-pair 100-ohm unshielded twisted-pair 100% annealed-copper solid-conductor cables, 100-ohm UTP multi pair copper cables. Fiber optic backbone cables shall be 50/125um Laser-Optimized Multimode Fiber and 8.3um low-water peak singlemode optical fiber cables compliant with ITU-T G.652D (or OS2). The cable shall support voice, data, and multimedia applications. The bending radius and pulling strength requirements of all backbone cables shall be observed during handling and installation.

2. All cables to be secured to walls with cable rings

a. Storage rings shall provide mechanical support and protection for optical fiber and copper cabling service loop storage. Ring shall have VELCRO Brand loops to contain and secure cable. Storage rings shall be available in 12-inch and 24-inch diameters.

b. Approved Products

i. Leviton 48900-IFR comes with six removable 3-inch VELCRO® Brand loops

ii. Leviton 48900-OFR comes with six fixed 9-inch VELCRO® Brand rings

iii. For double the capacity, install two storage rings side by side and route the cable in a figure eight pattern

B. Copper Backbone (Voice Riser)

1. Power-Sum Multi-Pair Category 3 cable, 24 AWG solid-copper conductors in 25-pair binder groups to support 10BASE-T, 100BASE-T and Analog Voice communications at 16Mhz.

2. Copper backbone cables shall be terminated onto a rack-mounted modular RJ45-style patch panel.

3. Terminate Category 3 cables onto Category 5e patch panels at 1 pair per port, with the last of the 25-pair cable coiled (full length) for future use. Use black outlet colors on patch panel for Category 3 connectivity.

4. Approved Products:

a. Leviton 24-port 110 punchdown patch panel, #5G596-U24

b. Berk-Tek # 10032111, 25-pr CMP, Gray.

c. Berk-Tek # 10032396, 25-pr CMR, Gray

d. Other multiples of 25 acceptable (50, 100, 200, 300pr as required)

C. Copper Backbone (Voice OSP)

1. Outdoor Type (used to interconnect buildings and run in underground duct) shall consist of a core of 24- gauge, Category 3, unshielded twisted (UTP) solid copper conductors dual insulated with foam skin and plastic encapsulated with a water blocking compound, surrounded by a corrugated aluminum shield, a corrugated steel shield and a polyethylene outer jacket. Pair sizes shall be available in 25, 50, 100, 150, 200, 300, 400, 600 and 900 pair. Pair quantities as specified herein and shown on the drawings.

a. Gauge 24 AWG

b. DC Resistance 26.5 (ohms/1000 ft.)

c. Mutual Capacitance (1 kHz) 15 pf/ft.

d. Impedance (1 kHz) 100 OHM (25 pair)

e. Max Attenuation (1 kHz) 6.707.8 dB (25 pair)

f. Cable shall terminate in a protector panel upon entrance to building. Cable and protector panel grounds shall be bonded to the electrical service ground as required by the N.E.C. Protector panel shall be Circa Technologies #188ENA1 series with #3B1E-W gas tube protector modules or equals by 3M. Provide protector panel fully loaded. Protector panel shall be sized to accommodate backbone cable pair count as specified herein.

g. All cable must be lightning protected at both ends.

h. Cable shall be labeled at both ends and at all accessible points. Coordinate labeling scheme with Owner and submit to Owner/Architect for review. PRIOR TO INSTALLATION

## 2.5. Frames, Racks and Cabinets

A. Floor mounted 2-post racks

1. Universal junction hole pattern matches most manufacturers racks. #12-24 panel mounting holes. Conformance to EIA/ECA-310-E and UL Listed (File No. E171936) as a communications circuit accessory.

2. Load Rating: 1200 Lbs. (544kg) weight capacity when evenly distributed for the height of the rack (84” (2133mm) and shorter).

3. Material: Aluminum. Twin top angles for rigidity.

4. Add (1) front/rear vertical wire manager on each side or between racks. See Wire Management, below.

5. Permanently stamped rack mount unit (RMU) markings included. Double sided universal (5/8" (16mm), 5/8" (16mm), 1/2" (13mm)) mounting spacing.

6. Includes thirty (30) dog point combo head (Phillips and flat blade) mounting screws.

7. Tapped assembly holes eliminate the need for nuts and simplifies assembly and squaring.
8. Approved Products:
    a. Chatsworth 2-Post Standard Rack, 19” x 7’ x 6” channel, 45RU, Black, 66353-703

B. Floor mounted 4-post racks
1. Open 19” 4-post frame with #12-24 tapped hole extruded aluminum mounting rails designed to provide nearly 360 degrees of accessibility and unrestricted air flow.
2. 84" (2133mm) 45RMU height with EIA/ECA-310-E universal 5/8" (16mm), 5/8" (16mm), 1/2" (13mm) hole pattern. Permanently stamped rack mount unit (RMU) markings and (100) #12-24 mounting screws included.
3. Depth adjustable in 1" (25.4mm) increments from 30" (762mm) to 36" (914mm) overall depth.
4. Load Rating: 2000 lb. (907kg) capacity, evenly distributed along rack height.
5. UL Listed to the UL60950 Standard - File No. E171936.
6. Approved Products:
    a. Chatsworth Four-Post Adjustable-Depth QuardaRack, Black, 15217-703

C. Vertical wire managers for 2-post/4-post racks
1. Provide full height, front-and-rear, 8” wide Vertical Wire Managers at the side of and between each 2-post and/or 4-post termination rack or frame. If space will not allow, the 5” wide wire manager may be substituted at row ends only, leaving the 8” vertical wire manager between each rack. Owner approval in writing is required prior to this substitution.
    a. The vertical cable management system shall be cULus listed, PCI rated for 94V-O, ABS rated for UL94HB, and compliant with ANSI/TIA/EIA 568-B standards.
    b. Mounting hardware shall be included to insure the proper installation to infrastructure. It shall mount onto a standard TIA/EIA recognized equipment rack.
    c. The management system shall offer an assortment of accessories, including a bend radius slack loop organizer, cable retainers, and shall accommodate top, bottom, side and pass-through cable routing. Dual hinged, cable concealing covers shall be included.
2. Approved Products:
    a. Chatsworth GVCS Global Vertical Cabling Section Double-Sided 8” Vertical Cable Manager, 14831-703

D. Wall mounted cabinets
1. 19RU usable 36” tall, 30” depth, 24” wide, 19” hole pattern, locking Plexiglass door

2. Enclosure features fully welded, 16 gauge (1.5mm) cold rolled steel construction.
3. Mounts to wall as left hinged or right hinged opening with Heavy duty, field reversible hinge and lock system.
4. Rear section can easily be separated from the cabinet for simple installation onto a wall and rear sections feature removable plates with either multiple knockouts for conduit or bushing installation, or a high-density foam gland plate for ease of installing pre-terminated patch panels.
5. Gland Plate Kit shall be available to adapt cabinet to fit over existing installed or terminated cables, as needed.
6. Provisioned for 16" (406mm) on-center mounting and multiple wire management lances for cable tie points or accessory mounting. Provide one Vertical cable lacing bar for each wall mount cabinet
7. Fully adjustable EIA/ECA-310-E compliant mounting rail system with #12-24 tapped rails. UL listed to the UL60950
8. 36" (914mm) high cabinets rated for 200 lb (91kg) load; 48" (1219mm) high cabinets are rated for 300 lb (136kg) load. 36# cabinet is standard, use 48” as required.
9. Approved Products:
    a. Chatsworth CubeIt line 11900-X24
    b. Chatsworth Low-Decibel Dual-Fan and Filter Kit for CUBE-iT Wall-Mount Cabinet 40975-001
    c. Chatsworth Wall mount 9’ (2.7 m) Ground Jumper, 1 Each 40159-009
    d. Chatsworth Wall mount 105 Cfm Fan Kit with Filter and Power Cord, VLWMFKB
    e. Chatsworth 12803-701 LED Light Kit, 5W, 120 Vac

E. Horizontal Wire Managers

1. Provide 2RU duct-style horizontal wire managers above and below or between every 2RU of patch panel, as space allows.
2. Cable managers shall be flat, covered duct style with front and rear channels.
3. Use recessed flat wire manager as needed within enclosed cabinets to route patch cords to opposite sides, where the rings of the flat wire managers would interfere with cabinet door closure.
4. Approved Products:
    a. Chatsworth Velocity Horizontal Wire Manager, 1RU, 13930-701

## 2.6. Cable Support Systems

A. J-Hooks

1. All cable shall be supported above ceiling on dedicated cable support hardware.

2. Cable saddles and J-hooks shall be used where cable tray or wire basket is not available. These must be supported on their own ceiling wires, threaded rod, or affixed to building structure by use of beam clamps (on metal beams) or wood screws (on wood beams). Affixing communication cable supports to existing ceiling support wires is not allowed.
3. Approved Products:
    a. B-Line Cable Hook, BCHxx
    b. B-Line Cable Hook, Cable to Beam Fastener, BCHxx-C2
    c. B-Line Cable Hook, Cable to Fastener, 2”, BCHxx-C442
    d. B-Line Cable Hook, Cable to Rod Fastener, 2”, BCHxx-W2
    e. Where: xx = 21 (1.25”), 32 (2”), or 64 (4”)

B. Cable Tray
1. In Telecom Rooms, cable tray (ladder runway) shall be installed to support all cable running to racks and cabinets.
2. Cable tray to be added to all Telecom Rooms in places where cable is run horizontally.
3. Cable tray shall be aluminum, with 9” rung spacing. Rungs can be removed or repositioned to accommodate specific project or building requirements.
4. Cable shall be combed and bundled in all exposed runs outside walls, in TR/TE, and inside cabinets and wire managers.
5. All appropriate cable tray support hardware including angle brackets, rack-to-runway brackets, wall-to-runway brackets, elevation kits, junction splices, butt splices, and grounding jumpers shall be used for a complete and professional installation.
6. Approved Products:
    a. B-Line Redi-Rail Runway, 12”, Black, SB13AL12FB
    b. B-Line Wall-Mount Brackets, Black, SB211312FB
    c. B-Line top mounting rack-to-rail plate, Black, SB213312FB
    d. All other associated mounting hardware and metals from B-Line

C. Jack/Outlet Brackets
1. Above-ceiling cable termination locations shall be either wall-mounted or suspended from structure above the drop ceiling. Cables or terminations shall not rest on ceiling grid or equipment above ceiling grid.
2. For Wireless Access Points and other above-ceiling-mounted communications devices, cables shall land in an above-ceiling bracket which is affixed to dedicated cable support hardware.
3. Two category-rated jacks may be installed in each above-ceiling bracket. Each above-ceiling bracket will hold a 2-port Surface-Mount Box or 1-U MOS SMB for multimedia applications.

4. For wall-mounted device locations (above or below ceiling), devices needing to be mounted directly to a backbox will utilize the in-wall mounting bracket to secure the jack inside the backbox.
5. One category-rated jack can be installed in each in-wall backbox jack mounting bracket. For devices requiring (2) category-rated jacks, (2) in-wall brackets must be used.
6. Approved Products:
    a. Leviton QuickPort In-Ceiling Bracket, rod/wire hanger, 49223-CBC
    b. Leviton QuickPort In-Ceiling Bracket, accepts beam and screw mounts, 49223-CB0
    c. Leviton QuickPort In-Wall Bracket, 49223-BA5 (pack of 5)

## 2.7. Fire Stop Systems

A. A. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur. Such devices shall:

1. Meet the hourly rating of the floor or wall penetrated.
2. Permit the allowable cable load to range from 0% to 100% visual fill thereby eliminating the need to calculate allowable fill ratios.
3. Permit multiple devices to be ganged together to increase overall cable capacity.
4. Allow for retrofit to install around existing cables.
5. Include an optional means to lengthen the device to facilitate installation in thicker barriers without degrading fire or smoke sealing properties or inhibiting ability of device to permit cable moves, add-ons, or changes
6. Not require any additional action on the part of the installer to open or close the pathway device or activate the internal smoke and fire seal, such as, but not limited to:
    a. Opening or closing of doors.
    b. Twisting an inner liner.
    c. Removal or replacement of any material such as sealant, caulk, putty, pillows, bags, foam plugs, foam blocks, or any other material.
7. Where single cables (up to 0.27 in. (7 mm) diameter) penetrate gypsum board/stud wall assemblies, a fire-rated cable grommet may be substituted. Acceptable products shall be molded from plenum-grade polymer and conform to the outer diameter of the cable forming a tight seal for fire and smoke. Additionally, acceptable products shall lock into the barrier to secure cable penetration.
8. Approved Products
    a. Specified Technologies, Inc. EZ-PATH series 22, 33 and 44+ fire-rated pathway devices

b. Specified Technologies, Inc. EZ-PATH GROMMET

B. Where non-mechanical products are utilized, provide products that upon curing do no re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during or after construction.

1. Where it is not practical to use a mechanical device, openings within floors and walls designed to accommodate telecommunications and data cabling shall be provided with re-enterable products that do not cure or dry.
2. Utilize an EMT sleeve as a stub through a rated wall
3. Surround annular space between EMT sleeve and wall material with a hardening intumescent caulk.
4. Utilize re-enterable, non-hardening putty around cables inside a metal sleeve. Do not exceed 40% fill capacity of sleeve and follow all rated assembly requirements per Manufacturer, local codes, and AHJ.

C. Cable trays shall terminate at each barrier and resume on the opposite side such that cables pass independently through fire-rated pathway devices. Cable tray shall be rigidly supported independent from fire-rated pathway devices on each side of barrier.

1. Approved Products
   a. Specified Technologies, Inc. SSS Intumescent Caulk
   b. Specified Technologies, Inc. SSP Intumescent Putty

## 3. EXECUTION

### 3.1. Additional Information

A. Refer to Section 27 00 00 for the following Part 3 - Execution information

1. General
2. Cable Pathways
3. Work Area Outlets
4. Installation Practices
5. Labeling
6. Firestopping
7. Sealing of Penetrations and Openings
8. Cable Supports
9. Cable Protection
10. Grounding
11. Documentation
12. Training

13. Cleaning
14. Project Closeout

## 3.2. Cable Handling / Cable Management

A. Proper cable handling is critical to maintaining the design integrity of high-performance cabling. Cable handling recommendations include:

1. Cable must be conditioned above 32 degrees F for 48 hours prior to installation.
2. Do not use excessive force when pulling cable. The maximum pull-force guideline for a 4-pair horizontal UTP should not exceed 110N (25lbf). Meeting this guideline avoids stretching conductors during installation and the associated transmission degradation.
3. The minimum bend radius for UTP should not exceed 4 times the cable outside diameter (O.D.) The O.D. of Cat 6A 100 ohm, balanced UTP cable is .30 in. (4 x .3 = 1.2 in. bend radius).
4. The minimum bend radius for fiber should not exceed 10x the cable outside diameter.
5. Traditional bundling of Category 6 and 6A cabling for a combed appearance is required in all exposed locations.
6. In TR, use appropriate horizontal cable management for patch cords on front of patch panels. Also, use appropriate cable management bar(s) for support of terminated horizontal cable.
7. Do not use vinyl or plastic cable ties due to the potential for over-cinching of cable bundles which can alter the cable geometry and degrade the system cabling performance. Use only hook and loop (“Velcro”) fasteners for bundling of horizontal cables.
8. Store cable slack in an extended loop configuration to alleviate cable stress. Excessive cable slack in bundled loops or traditional ‘service loops’ to provide additional cable length in TR has been shown to degrade cabling performance and are not recommended.

## 3.3. Separation of Data and Power cabling

A. Design cable pathways to avoid potential sources of EMI. Avoid installing cable near sources of EMI (X-ray equipment, large motors/generators, electrical power cabling and transformers, Radio frequency (RF) sources and transmitters, lighting, copiers, etc.).

B. Physically separate power & data cabling according to relevant code and standard requirements when run in a common pathway.

1. Never run data and Class 1 power cabling in parallel closer than 2”.
2. Avoid crossing cables if possible. If necessary, always cross cables at 90 degrees.

3. Maintain a minimum of 5 in. separation between data cable and all ballast controlled lighting.

C. Minimum separation distances of telecommunications cabling from potential sources of EMI exceeding 5kVA:

1. 24” away from Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways
2. 12” away from Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway
3. 6” away from Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway
4. 47” away from Electrical motors and transformers

## 3.4. Installation of Structured Cabling System

A. PRE-Installation Conference

1. Schedule a conference a minimum of five calendar days prior to beginning work of this section.
2. Agenda: Clarify questions related to work to be performed, scheduling, coordination, etc.
3. Attendance: Communications system installer, General Contractor, Owners Representatives and any additional parties affected by work of this section. Owner’s Information Technology must be represented at a pre-conference meeting prior to scheduling of any work.
4. Copy of Leviton warranty application will be provided by Contractor.
5. Pre-Installation conference may be waived only by Owner.

B. Warranty

1. A lifetime performance warranty covering all components, equipment and workmanship shall be submitted in writing with system documentation. The warranty period shall begin on the system’s first use by the Owner.
2. The project must be pre-registered with Leviton by the installation contractor before installation has begun and shall be concluded by contractor with uploading of test results to Leviton and a full project closeout. Warranty paperwork will be delivered directly from Leviton to the Owner.
3. Should the cabling system fail to perform within its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the Contractor shall promptly make all required corrections without cost to Owner.

C. Drawings and Specifications

1. The Contract drawings and specifications form an integral part of the contract documents. Neither the drawings nor the specifications shall be used alone. Drawings are generally diagrammatic and are intended to indicate the scope and general arrangement of work. Work omitted from the drawings but mentioned or reasonably implied in the specifications, or vice versa, shall be considered as properly and sufficiently specified and shall be provided.

Misinterpretation of any requirements on drawings, or specifications shall not relieve the Contractor of his or her responsibility of properly completing the Contract.

2. The Owner's Project Manager has the option of changing the location of Electrical and Communication outlets to within 3 meters of designed location prior to rough-in stage at no extra cost to Owner. Owner and Owner's Representative requests a chalk/rough-in walk prior to installation to verify locations.

3. The Contractor is responsible to take field measurements where equipment and material dimensions are dependent upon building dimensions and to coordinate and provide a chalk/rough-in walk prior to installation to verify locations.

4. The Contractor shall coordinate with General, Mechanical and Electrical trades as well as Furniture Layout Designer for final workstation outlet locations.

5. Where conflict exists between drawings and specifications the Contractor shall, make allowance for provision of the component, system, or installation process in a manner which will provide the highest monetary cost components, systems, or installation process. Contractor shall inform the Owner's Project Managers of the conflict and obtain approvals prior taking corrective measures.

D. Pathways and Topology

1. Utilize "thin film" lubricants only! It has been shown that cable-pulling lubricants will affect your testing as the cable needs several weeks to dry before attenuation levels recover. Use of incorrect cable lubricants will erode cable jacket and void cable warranty.

2. All cable and wire shall be concealed in conduits, floor ducts, paneling, ceiling or similar areas except at mutually agreed upon areas.

3. Fill capacity in conduit, modular furniture and other horizontal pathways should not exceed 40%. A maximum of 60 % pathway fill is allowed to accommodate unplanned additions after initial installation. The Cat 6A cable is a larger O.D. (0.275" – 0.30" vs. .23" for typical for Cat6 cable). The increased diameter of Cat 6A cable will require appropriate design considerations when sizing conduit and other pathways. In most installations, conduit sizes will have to be increased in order to accommodate all of the cables being installed. This will impact the design and material selection of the project. To calculate the fill ratio, divide the sum of the cross-sectional area of all cables, by the most restricted cross-sectional area of the pathway.

4. Fill ratios for Augmented CAT6 cable (CAT6A) requires 1" EMT for 4 cables and sized larger for additional cables as required to maintain a 60% fill ratio.

5. Flat-rung and/or solid bottom cable tray shall be utilized for large, high-density installations. J-hooks and other specific cable support hardware shall be used at all locations outside of cable tray.

6. Pathway design should not exceed (2) 90 degree bends between pull points or pull boxes (PB). If more than (2) 90 degree bends are required, install a pull box between bends.

7. Provide NEC-sized pullboxes for any run greater than 100 feet, or with more than two ninety-degree bends.
8. J-hooks should be randomly spaced 60” or less. Do not exceed J-hook capacity for size and weight limitations.
9. Land wireless access cabling above ceiling, secured onto in-ceiling bracket. A slack loop in the horizontal cabling is not required. Utilize varying-length patch cords when installing wireless access point devices for flexibility in length.
10. Crimp-on plugs at wireless access points are not allowed. Terminate all WAP cabling onto jacks and ceiling-mount brackets and test all cables as appropriate.
11. Mixing of various Category cables in the same pathway is allowed if the applications are appropriate for each category of cable used.
12. Prior to placing any cable pathways or cable, the contractor shall survey the site to determine job conditions will not impose any obstructions that would interfere with the safe and satisfactory placement of the cables. The arrangements to remove any obstructions with the Project Manager need to be determined at that time.
13. Maintain a distance of at least 12 inches from all power conduits and cables, and 6 inches from all fluorescent lighting fixtures. Do not install power feeders 100 amps or greater above or within 5 feet of telecommunications backboard. Do not install telecommunications conduits above power panels or switchboards.
14. Cable shall be installed above fire-sprinkler systems and shall not be attached to the system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.
15. The backbone subsystem shall include cable installed in a vertical manner between floor telecommunications room/closets (TCs or IDFs) and the main or intermediate cross-connect in a multi-story building and cable installed horizontally between telecommunications room/closets and the main or intermediate cross-connect in a long single story building.
16. Unless otherwise recommended by the Owner, all fiber cables will be encased in interlocking armor. All fibers will be terminated in the Telecom Rooms or Cabinets in rack-mounted enclosures equipped with sufficient ports to allow for growth, slack storage space and splice trays if required to terminate and secure all fibers.
17. Adequate riser sleeve/slot space shall be available with the ability to ingress the area at a later date in all Telecommunications rooms/closets, such that no drilling of additional sleeves/slots is necessary. Sleeves may need to be provided and installed under the scope of this Project.
18. The backbone cables shall be installed in a star topology, emanating from the main cross-connect to each telecommunications room/closet. An intermediate cross-connect may be present between the main cross-connect and the horizontal cross-connect.

19. For voice or data applications, 4 pair UTP or fiber optic cables shall be run using a star topology from the telecommunications room/closet serving that floor to every individual information outlet.
20. Backbone and Horizontal pathways shall be installed or selected such that the minimum bend radius is maintained both during and after installation.
21. All horizontal pathways shall be designed, installed and grounded to meet applicable local and national building and electrical codes.
22. Install ¾" x 4' x 8' fire-rated plywood across all walls in telecom rooms, from 6" AFF to 8'-6" AFF. Coat with 2 coats of white paint. Do not paint over fire rating stamp.
23. Contractor shall firestop all used pathways which enter or leave the telecom rooms via conduit, cable tray or slot. Contractor is responsible for installing sleeves at each wall or partition penetration, and firestopping all fire-rated penetrations. Intumescent caulk shall be applied around the outside of each sleeve, and intumescent putty inside the sleeve or conduits around the cables. Appropriate fill ratios must be followed when penetrating fire-rated walls.
24. Do not run fiber cables in conduits which are less than 2" in diameter.
25. Abandoned cable shall be removed from pathways (i.e., from tunnels, manholes, plenum spaces, and conduit) under scope of this project. Previously unknown or unidentified cable which is apparently abandoned prior to work shall be brought to the attention of the Owner for authorization prior to removal.

E. Grounding

1. Refer to section 27 05 26 for specifications on Grounding and Bonding.
2. All grounding (earthing) and bonding shall be done to applicable codes, standards and regulations.
3. Shielded cabling channels shall include appropriate method of bonding shield to approved ground for proper EMI/RFI mitigation.
4. Shield Continuity Testing shall be Enabled when shielded cabling channels are installed.
5. All shielded and armored cables shall be bonded to a telecom grounding system via shielded patch panels at the rack locations. Shielded Category-rated connectors must be properly installed to maintain electrical ground conductivity along entire length of cable and at both ends of the cable. UTP connectors shall not be used on shielded cables at either end.
6. Shielded Patch cords shall be provided for use and employed at each workstation location utilizing shielded cable. Shielded patch cords can be identified by their gray color and metallic RJ45 plug. Shielded patch cords are not required at the patch panels.
7. Telecom Contractor shall bond and ground all telecom room metals. Telecom Contractor shall provide and install TIA-rated Telecommunications Grounding Busbar (TGB) at all MDF and IDF locations, and an in-cabinet grounding busbar

at each remote wall-mounted cabinet or telecom enclosure. All ground lugs shall be 2-hole make-up.

8. Electrician will provide connection between TGB and building ground; Telecom contractor (if separate, otherwise electrician) will provide a busbar and ground all equipment and telecom metals to the busbar.

9. Telecom installer will ground and bond all armored and/or shielded cables, racks, cabinets, cable tray, ladder racking, and shielded panels to telecom grounding busbar.

F. Cables and Terminations

1. Check plans and symbology for final determination of faceplate constitution or consult with Owner prior to bid.

2. Install additional cables at drop locations and in quantities indicated on the drawings. Do not exceed manufacturers' recommendations for maximum allowable pulling tension, side wall pressure or minimum bending radius. Use pulling compound as recommended by cabling manufacturer.

3. All horizontal cables, regardless of media type, shall not exceed 90 m (295 ft) from the telecommunications outlets in the work area to the horizontal cross connect.

4. The combined length of jumpers, or patch cords and equipment cables in the telecommunications room/closet and the work area shall not exceed 10m (33 ft).

5. The Contractor shall observe the bending radius and pulling strength requirements of the 4 pair UTP and fiber optic cable during handling and installation.

6. No run of UTP cable between horizontal portions of the cross-connect in the telecommunication closet and the information outlet shall contain splices.

7. In a false ceiling environment, a minimum of 3 inches (75 mm) shall be observed between the cable supports and the false ceiling. Minimum 6" is preferred.

8. J-hooks shall be provided for all suspended cable, at a semi-irregular spacing not to exceed 5 feet between supports. Cables shall be supported by dedicated low-voltage cable support hardware. Support of cables or hanging hardware by means of supports or surfaces related to other trades or applications is not allowed.

9. Provide a full-size service loop (at least once around the inside edge of the box) in each J-box in the communications system.

10. Install all cable in plenum spaces with J-hooks of at least 1" in width to disperse the weight on the bottom cables. Homerun all cable to nearest TR Cabinet.

11. Comply with ANSI/TIA-569 for conduit and splice box sizing.

12. Install modular jacks at all outlets shown; one data jack for each data cable at each faceplate or termination point. Install additional cables and modular jacks as indicated on the drawings. Do not "split pairs" between different jacks.

13. Terminate cables at each jack location and at termination board or patch panel. Follow industry guidelines and manufacturers' recommendations and procedures as required. All termination hardware shall be rated to exceed their associated Category rating as specified above.
14. For enclosed ceiling WAP locations, install and terminate CAT6A cables to approximate location as shown on plans. For open-ceiling environments, secure cables and surface-mount boxes to nearest appropriate support structure.
15. For in-ceiling WAP locations, secure jacks inside a surface-mount block mounted to in-ceiling metal assembly, and provide a 5' patch cord or longer, as needed, to connect device to its final determined location in ceiling.
16. For wall-mounted device locations, utilize an in-wall bracket in lieu of faceplate as described above. Secure mounting bracket and device hardware directly over backbox. Connect device with 1' CAT6A cord (Security, AV, or WAP), or 1' high-flex CAT6 patch cord for other CAT6-based devices. Coil patch cord inside backbox.
17. Label and identify each outlet and cable for data circuits. Label at outlet end and at termination board or patch panel with matching designations.
18. Provide data outlets in surface raceway at 26" on center unless otherwise indicated.
19. Extreme care must be taken not to nick any of the copper conductors when removing jacket. Use rip cord to expose pairs for termination onto Insulation Displacement Contacts. You can also use a precision stripper that allows the technician to set the depth of the blade.
20. Maintain twists as close as possible to the point of termination. Untwisting of copper pairs should not exceed ¼" to the termination point.
21. Manage the cable bundles in a symmetrical orientation. For example, in a 48-port patch panel, distribute 24 cables through the vertical cable management on the left rear side of the rack and 24 cables through the vertical cable management on the right rear side of the rack.
22. Do not dress cables in bundles larger than 24 cables. Multiple 24-cable bundles may be run in parallel with evenly-spaced Velcro cable ties in an orderly sequence.
23. For cable management on rear of patch panel, cable shall sweep into termination points and be supported by appropriate rear cable management.
24. Horizontal patch cord management is required on all installations which do not use angled patch panels.
25. Maintain cable bend radius 4X outer diameter (UTP only) when mounting faceplate onto EMT backbox, box-eliminators or furniture knock-outs.
26. Faceplates and SMBs shall be fully installed and labeled prior to testing.

G. Above-Ceiling and wall mounted wireless access points and devices

1. All WAP locations shall receive (2) Category 6A cables from the nearest TE or TR (IDF). Multimedia, security and other video devices shall receive CAT6A cables as shown on drawings, documents and details. U.O.N.
2. Clock/Speakers and other low-bandwidth mounted devices shall receive (1) CAT6A cable.
3. WAP, IP Camera and other communications cables shall terminate on patch panels in the TE/TR (IDF).
4. WAP cables shall terminate on Category 6A information outlets and shall be supported by an in-ceiling termination bracket. Affixing of a 2-port SMB to the bracket is recommended.
5. SMB, jacks, and patch cords used in plenum spaces shall be plenum-rated.
6. SMB shall be mounted in the ceiling on a specially-designed clip attached to a cable support ceiling wire or threaded rod support per cable management section in Part 2. SMB shall not be tie wrapped to supports, or left on ceiling tiles or other equipment located above the ceiling.
7. Wall-mounted devices not requiring faceplates will be mounted directly to the backbox. Jacks will be secured inside backbox on a specially-designed in-wall bracket clip per cable management section in Part 2.
8. Contractor shall mount Access Point (AP) electronics to the drop-ceiling suspended T-grid system. (AP and mounting hardware provided by Owner). Contractor to provide and install (2) white Cat 6A patch cords from the overhead WAP outlets to the AP. Contractor shall neatly cut holes into the ceiling tile and finish the holes with grommets or other industry-standard finishing piece for a professional look.

H. Furniture Cabling

1. The contractor will pull all voice and data cables in advance of the installation of the modular furniture workstations, and coil at basefeed or above ceiling for power pole feeds. Upon furniture arrival, the contractor will feed the cables through power poles or base feed/wall connected data/telecom conduit, and terminate as specified on the floor plans.
2. Contractor to coordinate with Owner’s furniture vendor for timing of the installation of systems furniture, and installation of electrical and voice/data cabling. Overtime may be required for this and other phases of the project work, and bids, plans and schedules must reflect actual work demands. Contractor shall consider all costs in their bids for installation.

I. Terminal Blocks and Patch Panels

1. Arrange all terminal blocks in a manner that allows natural wiring progression and minimizes crossing of wires.
2. Dress and comb all incoming cable bundles in groups of 24 cables each. Eliminate crossed cables and “divers”.
3. Ground all shielded patch panels to telecom ground source via paint-piercing washers to a grounded rack, or via direct ground wire to telecom bus bar.

J. DATA/TELCOM Rooms (MC/MDF, HC/IDF)

1. The Data and Telco Rooms are a transition point between the backbone and horizontal distribution pathways. The rooms shall be able to contain data or telecommunications' equipment, cable terminations and associated cross-connection wiring. Closet spaces are not to be shared with electrical installations, other than those directly for telecommunications, video, security and information systems equipment. The rooms are not to be shared with other unrelated building service, for example plumbing. Any conflicts with these specifications require the approval of the Owner's project manager.
2. Contractor shall submit a drawing of the IDF room showing layout of all components including necessary and required electrical outlets, conduits, environmental requirements and wire termination fields prior to start of the job. Any jack densities noted in these specifications are estimates only. The drawing will designate the most effective, scalable, jack termination cabling design to facilitate data/telecom outlets shown on the lease exhibits. Owner's Project Managers must approve drawings prior to installation.
3. All racks, panels, and equipment finished shall be anchored to meet local seismic zone requirements and industry standards. The equipment racks are to be anchored to the concrete floors via "Unistrut or equal metal framing strut systems", threaded rod, concrete anchors, bolts and washers.
4. The overhead cable ladder system will provide a route for the Category 6 and 6A, and other communication cables while providing stability to the equipment racks.
5. The vendor is responsible to provide and install the specified count of 19" EIA rack-mount 7' (45U) 2- post racks, Black, as required in the new IDF. The vendor is responsible for submitting IDF layout drawings to Owner for approval prior to installation.
6. The contractor shall provide high capacity horizontal and vertical cable manager channels are required in all data and equipment racks, and the racks will contain sufficient vertical and horizontal cable managers to facilitate the patch panel density and placement installed by the contractor.
7. Contractor will install raceways, boxes, managers, and enclosures as indicated according to manufacturer's written instructions. Securely fasten each component to the surface to which it is mounted and remove burs and sharp edges from all cable tray.
8. A 12" ladder rack system is required and will be provided by the contractor and installed in the IDF to provide cable support to the rack system. This includes all of the required ladder rack support items such as rack to runway kits, wall angle brackets, ceiling supports, splices (junction and butt), radius drops and j-bolts. The final ladder rack layout will be included in the IDF layout drawing described above.
9. Provide and install as needed in the room 4' x 8" x 3/4" fire-rated plywood board and labeled with fire rating stamp facing into the room to accommodate rack ladder support, cabling support, grounding platform, data and voice equipment. Paint backboard white (leave stamp visible) to match existing backboard in room, if appropriate. Location of installation is to be determined with approval by Owner.

K. Patch Cords

1. Contractor to provide and install fiber and copper patch cords in quantities as described below. Neatly install patch cords in lengths as appropriate to reduce unnecessary length in wire managers.
2. Install patch cords at the equipment cabinet between patch panel and owner-provided switches for each patch panel and workstation location. Patch cords shall direct-connect between patch panel and networking switch or other electronics equipment. Dress and bundle patch cords as appropriate for final installation. Provide any unused equipment patch cables to Owner in original packaging upon completion of project.
3. Install Wireless Access Point patch cords as described above, and connect Cameras and other field-installed networkable device via a vendor-supplied patch cord at the remote locations. Return unused patch cords to Owner in original packaging.
4. Provide workstation patch cords to Owner in original packaging.
5. Use the following guidelines for project bid. Verify all lengths with Owner prior to purchase:
    a. Provide and install one (1) 7-foot patch cord, of the same category rating, for each cable terminated at the patch panel
    b. Provide one (1) 10-foot patch cord, of the same category rating, for each cable terminated at the terminal outlet location
    c. Provide one (1) 2-meter patch cord, of the same grade of fiber, for each LC connector pair installed at the IDF, MDF, and all other terminal enclosure locations.
6. All fiber patch cords and required workstation/equipment patch cords not installed shall be provided in hand to Owners Representative prior to project closeout.

L. Labeling

1. Provide machine-generated labels appropriate for all components supplied and installed. Under no circumstances shall hand written labels be used.
2. Each faceplate, cable, or data outlet (drop) will be numbered with a unique identifier clearly indicating the voice and data jacks by floor number, station, and outlet identification. This labeling scheme will be independent of any assigned telephone numbers.
3. The labeling scheme shall not include duplicates of any new or existing cable identification across the entire cable plant.
4. Labeling procedure will meet TIA-568, TIA-606 (Class 2 Administration) and BICSI Standards.
5. The labeling scheme will be provided at all locations within the cable infrastructure:
6. Labeling will be as follows:

a. The numbering scheme will be Floor Number, Jack Number.1 or .2. (7.###.1 and 7.###.2)

b. Label patch panel RJ-45 jacks numbered sequentially with 2 data jacks per station in line, designated by".1" and ".2".

c. Label Wireless Access Point cabling as AP01.1 / AP01.2, AP02.1/AP02.2, etc.

d. Label Racks containing patch panels as "DATA" and "VOICE".

## 3.5. Testing of Structured Cabling System

A. Copper Testing

1. Test all equipment and each outlet, horizontal cable, termination block, patch cords, etc. to verify compliance with requirements. Testing shall consist of attenuation and NEXT across all splices and devices installed in the field and shall meet latest requirements of EIA/TIA. Re-terminate any cable or connection found to be defective.

2. Tester is to be a Level IV device or better, and configured with the specific cable installed, and the Permanent Link test will be performed according to the Category's standard methodology. All parameters must exhibit a PASS test result prior to project completion. PASS*, FAIL* or FAIL test results will not be accepted.

3. Only a permanent link test for Category 6A will be required. If situations demand a "hybrid", "Mixed" or a standard "Channel" design, approval must be obtained for those specific circumstances prior to testing.

B. Fiber Optic Testing

1. Each pre-terminated fiber strand shall be tested for continuity and attenuation with an Optical Power Meter and light source for actual length and splice/connector loss. Each field-terminated fiber strand (if any) shall be tested for attenuation with an Optical Power Meter and light source and with an Optical Time Domain Reflectometer (OTDR) for actual length and splice/connector loss.

2. Cable length shall be verified using sheath markings. The guidelines and procedures established for Tier 1 testing in TIA/TSB-140 shall apply.

3. All fiber optic cables shall be tested from the site's MDF to each fiber terminals located in the IDF.

4. The Contractor shall conduct a bi-directional power meter (loss) test of each fiber optic station and riser cable at both wavelengths, 850/1300nm for MM and 1310/1550nm for SM.

5. No individual station or riser fiber link segment (including connectors) shall measure more than 2.0 dB loss for LC, and 1.5dB loss for MTP. LC links shall be tested with LC jumpers from the LC cassette to the tester. MTP links shall be tested either with an MTP tester and array cord, or with an MTP-LC breakout harness and LC duplex fiber tester.

6. Tests shall be conducted using ANSI/TIA-526-14A, Method B. Test results evaluation for the panel to panel (backbone) shall be based on the values set forth in ANSI/TIA-568.
7. The Contractor shall provide an electronic printout for each strand tested with the Power Meter and the OTDR.
8. Where concatenated links are installed to complete a circuit between devices, the Contractor shall test each link from end to end to ensure the performance of the system. After the link performance test has been successfully completed, each link shall be concatenated and tested. The test method shall be the same used for the test described above. The evaluation criteria shall be established between the Owner and the Contractor prior to the start of the test.
9. All installed cables must meet or exceed the defined standards for performance. The Contractor shall take all steps and all expense necessary to clean, repair or replace any optic link not meeting the standard.

C. Test Results

1. Repair and resolve any shortcomings in the test results. Mitigation efforts may require re-termination or replacement of the jack, outlet or cable. Repairs or attempts to resolve test failures will be completed solely at the expense of the Contractor.
2. Provide test results to Manufacturer and Owner representative in native Tester format. Upon request, provide a copy of the tester software and license, if needed, at no charge to Owner representative.
3. Include PDF of full test results, summary index in electronic format on CD or memory stick in the O&M package upon project completion.
4. Cabling systems shall meet or exceed the electrical and transmission characteristics of the systems specified.
5. Cable segments and links shall be tested from both ends of the cable for each of the construction phases. (Verify that cable labeling matches at both ends).
6. The system shall not be considered certified until the tester has acknowledged that the performance of the physical layer of the system has been fully tested and is operational at the completion of the installation phase.
7. After the installation is complete, in addition to any other required testing as described herein, and at such times as the Owner/Engineer directs, the Contractor shall be present while the Owner conducts an operating test for approval. The installation shall be demonstrated to be in accordance with the requirements of this specification. Any defects revealed shall be corrected promptly at the Contractor's expense and the tests performed again.
8. After review of the completed test results, the Owner reserves the right to retest cables, utilizing the Contractor's tester and the Contractor's labor.
9. The test results information for each link shall be recorded in the memory of the field tester upon completion of the test. The tester shall be capable of storing test data in either internal or external memory. The external media used shall be left to the discretion of the user.

10. Test results saved by the tester shall be transferred into a Windows based database utility that allows for maintenance, inspection and archiving of these test records. A guarantee must be made that the measurement results are transferred to the PC unaltered as well as any printed reports generated from the software application.
11. Test results shall be provided in both native Tester format as well as comma separated variable (.csv), Portable Document File (.pdf), plain text (.txt), or hypertext markup language (.html/.htm). A copy of the tester native test software must be provided to Owner or Owner's representative for comparison of results.
12. Test Results for CAT6/6A shall include the following:
    a. Applicable room number of jack location (room number per Contract Documents)
    b. Applicable Telecommunications Room number
    c. Circuit I.D. number with corresponding jack identifier
    d. Wire Map – shall include the following:
    e. Continuity to the remote end
    f. Shorts between any two or more conductors
    g. Crossed pairs
    h. Reversed pairs
    i. Split pairs
    j. Any other mis-wiring
    k. Length
    l. Insertion Loss
    m. Near-end Crosstalk (NEXT) Loss
    n. PS-NEXT (Power Sum Near End Cross Talk)
    o. FEXT (Far End Crosstalk)
    p. ELFEXT (Equal Level Far End Cross Talk)
    q. PS-ELFEXT (Power Sum Equal Level Far End Cross Talk)
    r. Propagation Delay
    s. Delay Skew
    t. Return loss
    u. PSFEXT (Power Sum Far End Crosstalk)
    v. PSACRF (Power Sum Attenuation to Crosstalk Ratio, Far End)
13. Test Results for CAT6A shall include all of the above, plus the following:
    a. AACRF (Alien Attenuation to Crosstalk Ratio, Far End)

b. AFEXT (Alien Far End Crosstalk)

c. ANEXT (Alien Near End Crosstalk)

d. PSANEXT (Power Sum Alien Near End Crosstalk)

e. PSAACRF (Power Sum Alien Attenuation to Crosstalk Ratio, Far End)

14. Approved Tester Products:

a. Softing WireXpert series tester

b. Fluke DTX or later platform Cable Certification testers

c. Linkware Record Management Software

## 3.6. Project Closeout

A. Operating and maintenance manuals shall be submitted prior to testing of the system. A total of (4) manuals shall be delivered to the Owner. Manuals shall include all service, installation, and programming information.

B. Provide a full set of “as-built” (redline) drawings in AutoCAD DWG and PDF format. Drawings to depict final location and drop/cable identification numbers and labels which match the test reports. Include (1) hard copy paper format of all as-builts in 30”x42” size or equivalent, posted in each telecom room involved in the project.

C. Contractor to provide all warranty information to Leviton for processing. Leviton will send warranty document direct to Owner.

## 3.7. Training

A. Provide four (4) hours training on the operation and installation of the data system, at job site, at no cost to owner.

B. Training shall be a walk thru of all systems cabling locations and required maintenance procedures.

**END of SECTION**

**SECTION 284600**
**FIRE DETECTION AND ALARM**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

A. Fire alarm system and associated components, including control units, related equipment, initiating devices, and notification appliances.

1.2 RELATED REQUIREMENTS

A. Section 260533.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

D. NECA 305 - Standard for Fire Alarm System Job Practices; 2018.

E. C.E.C. – California Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.

G. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

H. NFPA 1225 - Standard for Emergency Services Communications; 2022.

I. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems; Current Edition, Including All Revisions.

J. UL 464 - Standard for Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories; Current Edition, Including All Revisions.

K. UL 521 - Standard for Heat Detectors for Fire Protective Signaling Systems; Current Edition, Including All Revisions.

L. UL 864 - Control Units and Accessories for Fire Alarm Systems; Current Edition, Including All Revisions.

M. UL 1480 - Standard for Speakers for Fire Alarm and Signaling Systems, Including Accessories; Current Edition, Including All Revisions.

N. UL 1711 - Amplifiers for Fire Protective Signaling Systems; Current Edition, Including All Revisions.

O. UL 1971 - Standard for Signaling Devices for the Hearing Impaired; Current Edition, Including All Revisions.

P. UL 2075 - Standard for Gas and Vapor Detectors and Sensors; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1) Coordinate arrangement of equipment with dimensions and clearance requirements of actual equipment.

2) Coordinate placement of devices and notification appliances with potential conflicts or view obstructions.

3) Coordinate work to provide power for equipment at required locations (e.g., smoke dampers, type of actuators, line or local control transformer, zoning, grouping and circuit activations).

4) Coordinate requirements for branch circuit protection, identification, and shunt trip if applicable.

5) Coordinate reflected ceiling plans to avoid conflicting placements; maintain minimum diffuser and detector clearances as indicated.

6) Coordinate submittals to confirm equipment and associated components are capable of indicated settings, and manufacturer documentation identifies required compatible product listings.

7) Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Scheduling:

1) Arrange access to facility for data collection with facility representative.

2) Where work involves interruption of existing electrical or fire alarm system service, arrange interruption with Owner.

a) Arrange test start and end with responsible reporting service. Confirm system normal operating mode and record as-found and as-left settings.
b) Arrange work to disable individual devices or circuits for minimal disruption if possible.
c) Arrange in accordance with NFPA 72 fire alarm system impairment requirements.
d) Where required by AHJ, arrange systems or partial system out of service interruption in accordance with requirements of building, life safety, and fire codes (e.g., approved fire watch plus required notifications, tags at each fire department connection and control valve, and AHJ notification when excess hours).

1.5 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Evidence of designer qualifications.

C. Comply with NFPA 72 chapter "Documentation," including noting names of installers, owners, and system classification information.

D. Design Documents: Submit all information required for plan review and permitting by AHJ, including floor plans, riser diagrams, and description of operation.

1) Copy (if any) of list of data required by AHJ.

2) NFPA 72 "Record of Completion", filled out to extent known at time.

3) Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A, and complete listing of software required.

4) Manufacturer's detailed product data sheet for each component, including wiring diagrams, and circuit length limitations. Catalog pages and product descriptions include ratings, dimensions, finishes, service conditions, and included features.

5) Certification by manufacturer of FACU that system design complies with Contract Documents.

6) Certification by Contractor that system design complies with Contract Documents.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Evidence of installer qualifications.

G. Evidence of maintenance contractor qualifications, if different from installer.

H. Inspection and Test Reports:

1) Submit inspection and test plan prior to closeout demonstration.

2) Submit documentation of satisfactory inspections and tests.

3) Submit NFPA 72 "Inspection and Test," filled out.

I. Operating and Maintenance Data: See Section 01 7800 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:

1) Complete set of specified design documents, as approved by AHJ.

2) Additional printed set of project record documents and closeout documents, bound or filed in same manuals.

3) Contact information for firm that will be providing contract maintenance and trouble call-back service.

4) List of recommended spare parts, tools, and instruments for testing.

5) Replacement parts list with current prices, and source of supply.

6) Detailed troubleshooting guide and large scale input/output matrix.

7) Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.

8) Detailed but easy to read explanation of procedures require recording of system trouble events by qualified personnel, such as when routine testing is being conducted for fire drills and when entering into contracts for building renovations.

J. Project Record Documents: See Section 01 7800 for additional requirements, have one set available during closeout demonstration:

1) Complete set of floor plans showing actual installed locations of components, conduit, and zones.

2) "As installed" wiring and schematic diagrams, with final terminal identifications.

3) "As programmed" operating sequences, including control events by device, and updated input/output chart.

a) ECS: Voice messages by event.

K. Closeout Documents:

1) Certification by manufacturer that system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.

2) NFPA 72 "Record of Completion," filled out completely and signed by installer and authorized representative of AHJ.

3) Certificate of Occupancy.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Firm with minimum three years documented experience installing fire alarm systems of specified type and providing contract maintenance service as regular part of their business.

1) Authorized representative of FACU manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.

2) Installer Personnel: At least two years of experience installing fire alarm systems.

3) Supervisor: Level III (three) or Level IV (four) certified fire alarm technician; furnish name and address.

B. Manufacturer Qualifications: Company specialized in manufacturing products specified in this section with at least three years of documented experience.

C. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.

1.7 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Fire Alarm Control Units and Accessory Equipment: Provide minimum 3-year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

C. Fire Alarm System Detectors: Provide minimum 1-year year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

D. Fire Alarm System Notification Appliances: Provide minimum 1-year year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

**PART 2 PRODUCTS**

2.1 FIRE ALARM SYSTEM

A. General Requirements:

1) Provide new fire alarm system complying with C.E.C., NFPA 72, NFPA 90A, and consisting of required equipment, conduit, cabinets, outlet boxes, wiring, connectors, hardware, supports, accessories, components, software, and system programming as necessary for complete operating system that provides functional intent indicated.

2) Comply with the following; where requirements conflict, order of precedence of requirements is as listed:

a) 36 CFR 1191 and ADA Standards.
b) Requirements of State Fire Marshal.
c) Requirements of AHJ.
d) Applicable local codes.
e) Contract Documents.
f) NFPA 72; "should" is mandatory; where conflicts between requirements require deviation, identify deviations clearly on design documents.

3) Fire Alarm System Products:

a) Listed, classified, and labeled as suitable for purpose intended.
b) Installation Environments: Provide products suitable for their respective indoor and outdoor applications.

4) Provide fire alarm circuits in accordance with C.E.C..

a) Comply with methods of interconnecting FACUs in accordance with NFPA 72 and C.E.C..
b) Power Sources:
Comply with requirements for power supplies of emergency systems in accordance with C.E.C..
Primary: Dedicated branch circuits from facility power distribution system.
Secondary: Storage batteries with capacity to operate system for period specified by NFPA 72.
c) Wiring and Wiring Methods:
General Requirements:
(a) Comply with requirements for wiring and wiring methods in accordance with C.E.C..
(b) Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum-rated, listed and labeled as suitable for use in return air plenums.
(c) Special Occupancies: Comply with C.E.C..
(d) Comply with C.E.C. for wire and cable plenum, riser, general-purpose, limited-use, undercarpet, and underground applications.
Fire Alarm Circuits:

(a) Comply with C.E.C. for conditions and types required for multiconductor cable systems.
(b) Non-Power-Limited Fire Alarm (NPLFA) Circuits:
(1) Provide dedicated NPLFA non-GFCI branch circuits for fire alarm equipment and marked by red identification in accordance with C.E.C..
(c) Power-Limited Fire Alarm (PLFA) Circuits:
(1) Provide identification for PLFA circuits in accordance with C.E.C..

5) Provide pathway class designations and pathway survivability, as defined in NFPA 72.

a) Provide monitoring of conductors and other signaling channels for integrity and circuit performance.

b) Pathway Class Designations:

Unless otherwise indicated or required, pathways to meet the following requirements:

(a) SLCs: Class B (star, tee-tap, multi-tap, with no return).
(b) IDCs: Class B (daisy-chain with EoL resistor device installed at end of circuit).
(c) NACs: Class B (daisy-chain with EoL resistor device installed at end of circuit).
(d) Network Communications: Class B.

B. Fire Alarm System Interfaces and Control Functions:

1) UL 864 listed unless otherwise indicated.

2) Descriptions below are intended to provide means for interface. See project SOOs, narrative, and input/output matrix for execution requirements.

3) Provide initiating devices, interfaces, and control functions for emergency control function interfaces in accordance with NFPA 72.

4) Provide monitoring of interconnected systems. Coordinate notification appliance alternate markings as indicated on drawings.

5) HVAC Systems:

a) Air Handling Units (AHUs) and Roof Top Units (RTUs):

Provide connection to all duct smoke detector on supply side of air stream for units over 2,000 cfm.
Provide remote test station for each duct smoke detector unless explicitly indicated as not required.
Provide output signal to shut down units with at least one duct smoke detector via addressable relay module.
Where fire/smoke dampers are located downstream of unit, provide monitoring point input to determine that unit is not operational and subsequently provide output signal to close such dampers via addressable relay module and power isolation relay.

2.2 FIRE ALARM CONTROL UNITS AND RELATED EQUIPMENT

A. Fire Alarm Control Units and Related Equipment: Listed and labeled as complying with UL 864.

B. Provide cabinets and enclosures as indicated or as required to house system components.

C. Fire Alarm Control Unit (FACU): Addressable and compatible with existing campus fire alarm system..

1) SLCs and IDCs: Configurable for Class B or Class A with additional modules.

2) NACs: Integral and programmable with synchronization modules or cards as required.

3) Power Supply: 120 VAC, 60 Hz, supplying necessary power for FACU.

4) User-Interface: Touchscreen display for system interfacing and service mode settings, include password and user credentials; configurable for custom actions and incorporates historical event log.

5) Support self-testing detector capability.

6) Remote Annunciator Support: Up to 10.

7) Provide NAC expansion as required.

8) Networking: Mixed copper and fiber media.

9) ECS: Separate system, integrated with FACU.

D. Notification Appliance Circuit Expansion:

1) Where notification appliance circuit requirements exceed capacity of FACU, provide accessories and cabinets as required for expansion.

E. Networking:

1) Comply with C.E.C..

2) FACU capable of communicating over network utilizing peer-to-peer, inherently regenerative communication and format.

3) Provide network media converters as required.

4) Provide network repeaters as required.

5) Networks with Copper Media:

a) Provide surge protection for wiring that leaves structure.

6) Networks with Fiber Media:

a) Provide terminal box at each node for fiber demarcation.

b) Provide patch cables between terminal box and network interface module to facilitate troubleshooting and testing of connections.

F. Emergency Communications System (ECS):

1) Comply with NFPA 1225.

2) Amplifiers listed and labeled as complying with UL 1711.

3) Separate System, Interconnected to Fire Alarm System:

a) Provide 70 Vrms audio amplifiers as required.
b) Class A or B speaker circuit expansion capability via additional modules and remote distributed amplifiers.
c) Supervise speaker circuits wiring during standby, background music, and alarm.

G. Addressable Interface Modules:

1) General Requirements:

a) Provide addressable modules suitable for connection to FACU SLCs.
b) Unless otherwise indicated, use addressable modules only in clean, dry, indoor, nonhazardous locations.

2) Addressable Monitor Modules: Unless devices are explicitly permitted connected together on one zone; provide separate addressable monitor module for each conventional dry-contact input device in order to be individually identifiable by addressable FACU.

3) Addressable Relay Modules:

a) Provide as indicated or as required to perform necessary functions via dry-contact interface.
b) Where load exceeds module contact rating, provide accessory power isolation relays suitable for load as required.

H. Alarm Communication:

1) Supervising Station Alarm Systems:

a) Provide accessories as required for interface with supervising station as indicated and as required by AHJ.
b) Communication Method: Single path, cellular.
c) Supervise communication paths at interval required by NFPA 72.

I. Remote Annunciators:

1) LCD Remote Annunciators:

a) Provide backlit LCD display that mimics FACU display.
b) Provide dedicated status indications for power and alarm, supervisory, and trouble conditions.
c) Enable system control functions including acknowledge, silence, and reset.
d) Provide local audible alarm.
e) Mounting: Wall-mounted; provide flush-mounted annunciator for finished areas and surface-mounted annunciator for non-finished areas unless otherwise indicated.

2.3 FIRE ALARM SYSTEM INITIATING DEVICES

A. General Requirements:

1) Addressable Systems:

a) Addressable Devices: Individually identifiable by addressable FACU; suitable for connection to FACU SLCs.

b) Conventional/Nonaddressable Devices: Provide addressable interface modules as indicated or as required for connection to addressable FACU. Unless devices are explicitly permitted to be connected together as one zone, provide separate addressable monitoring point for each device in order to be individually identifiable by addressable FACU.

2) Provide devices and associated accessories suitable for intended application and location to be installed. Unless otherwise indicated, use addressable devices and addressable interface modules only in clean, dry, indoor, nonhazardous locations.

3) Surface-Mounted Devices: Provide manufacturer's accessory surface mount backboxes or suitable outlet/device box.

4) Devices for Outdoor and Damp/Wet Locations: Weatherproof, suitable for outdoor use; provide manufacturer's accessory backboxes or enclosures in accordance with product listing.

5) Devices for Hazardous/Classified Locations: Listed and labeled as suitable for classification of installed location.

B. Spot-Type Detectors:

1) Utilize plug-in mounting to separate base with tamper-resistant feature; provide bases as indicated or as required.

2) Addressable Detectors:

a) Provide LED indication of normal operation and regular communication with FACU and alarm condition.

3) Smoke Detectors:

a) Listed and labeled as complying with UL 268.
b) Provide sensor type (e.g., photoelectric, ionization) as indicated.

4) Thermal/Heat Detectors:

a) Listed and labeled as complying with UL 521.
b) Provide sensor type (e.g., fixed temperature, rate-of-rise) and rating as indicated.

5) Carbon Monoxide Detectors:

a) Listed and labeled as complying with UL 2075.
b) Provide end-of-life notification.

6) Combination and Multi-Criteria Detectors: Comply with respective requirements for each detection method.

2.4 FIRE ALARM SYSTEM NOTIFICATION APPLIANCES

A. General Requirements:

1) Provide signaling notification appliances listed for fire-protective service and intended operating mode, public or private; suitable for connection to FACU notification appliance circuits.

2) Provide notification appliances and associated accessories suitable for intended application and location to be installed. Use notification appliances only according to listed mounting (e.g. ceiling, wall).

3) Surface-Mounted Notification Appliances: Provide manufacturer's accessory surface mount backboxes or suitable outlet/device box.

4) Exterior Notification:

a) In addition to required occupant notification, provide notification appliances on exterior of building.

b) Outdoor and Damp/Wet Locations: Weatherproof, suitable for outdoor use; provide manufacturer's accessory backboxes or enclosures in accordance with product listing.

5) Notification Appliance Derating: Include device derating adjustments in accordance with listing where applicable, including the following.

a) Where accessory protective guards or enclosures are utilized.

b) Where required by field conditions (e.g., ambient temperature and sound).

6) Notification Appliance Color: As indicated on drawings.

B. Visible Notification Appliances:

1) Public Mode Operation: Listed and labeled as complying with UL 1971.

2) Strobes: Clear or nominal white lens with flash rate of 1 Hz unless otherwise indicated or required; xenon or LED light source with maximum pulse duration of 0.02 seconds; candela rating as indicated.

a) Where field-selectable candela strobes are specified, substitution of fixed candela strobes is not permitted.

C. Audible Notification Appliances:

1) Listed and labeled as complying with UL 464.

2) Rated Sound Pressure Level: As required to achieve design sound pressure levels, but not less than 75 dBA at 10 feet (3.1 m) for public mode operation or 45 dBA at 10 feet (3.1 m) for private mode operation in accordance with UL 464.

D. Speakers for ECS:

1) Listed and labeled as complying with UL 1480.

2) Rated Sound Pressure Level: As required to achieve design sound pressure levels, but not less than 75 dBA at 10 feet (3.1 m) in accordance with UL 1480.

3) Frequency Range: 400 to 4,000 Hz minimum in accordance with UL 1480; listed for producing 520 Hz low frequency alarm signal for sleeping areas in accordance with NFPA 72.

4) Speaker Voltage: Field configurable, matched to audio distribution circuit voltage.

5) Provide minimum of four field-selectable power taps.

2.5 WIRE AND CABLE

A. General Requirements:

1) Comply with C.E.C. listing and marking requirements for cables.

2) Substitution of fire alarm listed cables for communication wiring, in accordance with C.E.C., is permitted, by substitution procedures.

3) Provide cables as indicated or as required for connections between system components.

a) Data Cables for IP Network Connections: Unshielded twisted pair (UTP) complying manufacturer's minimum requirements.

B. Power-Limited Fire Alarm Cables (PLFA):

1) Comply with applications of listed cables in accordance with Chapter 7 of NFPA 70.

C. Non-Power-Limited Fire Alarm Cables (NPLFA):

1) Comply with listing requirements in Chapter 7 of C.E.C..

2.6 ACCESSORIES

A. Provide components as indicated or as required for connection of fire alarm system to devices and other systems indicated.

B. Provide EoL resistors as required for wiring supervision.

**PART 3 EXECUTION**

3.1 EXAMINATION

A. Verify that mounting surfaces are ready to accept components and equipment, with suitable support frames and anchors installed where required.

B. Verify ratings, configurations, and characteristics of system components.

C. Verify rough-ins for field connections.

D. Verify that work likely to damage fire alarm system has been completed.

E. Verify that interior of building has been protected from weather.

F. Perform preinstallation tests and inspections per manufacturer's instructions and in accordance with NECA 305.

G. Verify that system bonding is in accordance with Section 260526.

H. Do not energize system until deficiencies have been corrected.

I. Verify that branch circuit wiring installation is completed, tested, and ready for connection to fire alarm system. Overcurrent protection ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.

3.2 PREPARATION

A. Prior to installation, confirm environment of installation area is clean, and with ambient temperature, humidity, and ventilation requirements are per manufacturer's written instructions.

1) Clean and vacuum in accordance with manufacturer's written instructions. Confirm equipment ventilation holes are absent of obstructions and free for air flow.

2) Clean pathways thoroughly to remove foreign materials before installing conductors and cables.

3) Clean dirt, debris, plaster, and other foreign materials from equipment enclosures, cabinets, and outlet boxes.

4) Clean surfaces to receive adhesive products according to manufacturer's instructions.

B. Follow tool requirements for installation, including torquing adjustments, as listed in manufacturer documentation.

C. Remove detector dust covers prior to system energization.

3.3 INSTALLATION

A. Install field-devices, components, FACU and related equipment, and accessories in accordance with the following:

B. Field Locations:

1) Arrange equipment to provide minimum operational clearances and required maintenance access in accordance with manufacturer's instructions and NFPA 70.

2) Conceal wiring, conduit, outlet boxes, and supports where installed in finished areas; maintain code-required access.

C. Raceways and Supports:

1) Coordinate locations of outlet boxes as required for installation. Only install boxes and equipment at locations based on application standards indicated in NFPA 72.

2) Secure and support raceways at intervals complying with NFPA 70. Provide supports where vertical rise exceeds permissible limits.

a) Minimum conduit size: 1/2".

3) Install firestopping to preserve fire resistance rating of partitions and other elements.

D. Wiring and Connections:

1) Maintain separation of Class 1, Class 2, Class 3 remote-control, signaling, fire alarm circuits, and power-limited circuits in accordance with cable insulation class and NFPA 70.

2) Maintain circuit pathway and class designations in accordance with NFPA 72 for configuration, separation, and survivability.

3) Comply with permitted and not permitted installations for wires, cables, cable routing assemblies, communications circuits, and fire alarm circuits in accordance with C.E.C..

4) Secure and support conductors and cables in accordance with C.E.C. using suitable supports and methods approved by AHJ. Provide independent support from building structure and suspended ceiling systems. Do not provide support from raceways, piping, ductwork, or other systems.

5) Provide grounding and bonding in accordance with Section 260526.

6) Comply with manufacturer's minimum cable sizes or ratings.

7) Do not exceed manufacturer's recommended maximum power, signal, or network cable lengths between components.

8) Provide network wiring in accordance with C.E.C..

9) Neatly train and bundle conductors inside boxes, wireways, and cabinets.

10) See manufacturer's instructions for batteries.

E. Fire Alarm System Components:

1) Install field-installed devices, components, relays, notification appliances, accessories, and when applicable EoL resistors.

a) Install wiring to supervisory devices and associated EoL resistors as required for supervision of hardwired connections

2) Install Wall-Mounted Equipment: Assemble component hardware within (e.g., card bays, sub-bays, expansion bays, signal cards, other card frames, networking, signal transmission, application modules, tamper monitoring devices, interconnecting modules, and auxiliary power supplies), including space for required spare capacity, and configure settings.

3) Install Interconnect Wiring: Connect system cabinets, install processor and cards, cabling, connectors, terminations, and bonding.

F. Branch Power:

1) After installation confirmations, follow manufacturer instructions to connect branch circuit power cables to premises fire alarm system components; comply with NFPA 70.

2) Where accessories require auxiliary power, provide control power source and monitoring as indicated or as required to complete installation.

3) Install auxiliary power supplies, including indicated monitoring, and connections necessary for remote equipment.

G. System Identification:

1) Identify devices, notification appliances, components, cables, and equipment in accordance with approved submittals. See Section 260553.

2) Confirm fire alarm system programming meets requirements of SOO and sub-system SOOs.

3) Mark location of disconnecting means for NPFLA circuits.

4) Coordinate to provide red branch power circuit protective devices or identify them accordingly as required by NFPA 72 and C.E.C..

5) Mark date of batteries installed on inside cover of panels and formal maintenance logs.

H. Troubleshooting and Installer Checks:

1) Field test connectivity periodically during installation process to avoid unexpected troubleshooting.

2) Check system operation for notification, FACU functions, circuit supervision, alarm initiating devices, supervisory initiating devices, dress panels/doors/covers, and programming before performing field tests.

I. Fire Alarm System Tests:

1) Perform required tests of NFPA 72. Record measured values during operational checks.

2) Confirm functional testing of fire alarm system is as indicated in Contract Documents.

3.4 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Provide services of manufacturer's authorized representation to observe installation and assist in inspection, testing, and adjusting. Include manufacturer's detailed testing procedures and field reports and with submittals.

C. Provide equipment, two-way radios for testing personnel use, tools, and supplies required to accomplish inspection and testing.

D. Notify Owner and Architect at least two weeks prior to scheduled inspections and tests.

E. Inspect and test in accordance with manufacturer's instructions.

F. Inspect wiring and components for damage and defects.

G. Batteries and Power Supplies: Perform inspections and tests listed in manufacturer installation instructions.

H. Perform additional requirements related to testing and inspection during system startup.

I. Test for interface with other systems.

J. Correct defective work, adjust for operation, and retest until entire system complies with Contract Documents.

K. Submit detailed reports indicated inspection and testing results, corrective actions taken, and as-found and final adjusted settings.

3.5 SYSTEM STARTUP

A. Obtain Owner approval prior to performing system startup.

B. Prepare and start equipment and systems in accordance with manufacturer's instructions and recommendations.

3.6 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust initiating device and notification appliance settings to achieve desired operation as indicated in submittals.

C. Measure power supply primary and secondary voltages, log values for records, and make appropriate adjustments.

D. Adjust alignment of equipment covers and doors. Provide keys and spare keys to Owner.

E. Reprint and reinstall damaged or misinstalled labels; maintain neat and square to installed location good workmanship - see NECA 1; maintain consistent placements for identification on products of similar type.

F. Adjust devices or notification appliances and associated bases to be flush and level.

G. Program system parameters according to requirements of Owner.

3.7 CLEANING

A. Check tightness of electrical connections. Replace damaged components and provide closure plates for vacant positions. Provide circuit directory updates for related power branch circuits.

B. Clean and repair existing materials and equipment that remain or are indicated for reuse.

C. Clean dirt, debris, plaster, and other foreign materials from outlet boxes and fire alarm system equipment and components.

D. Clean fire alarm system equipment and components according to manufacturer's instructions and NECA 305.

E. Clean surfaces and interiors of boxes and device cover plates in accordance with manufacturer's instructions to remove dirt, fingerprints, debris, plaster, and other foreign materials.

F. Repair scratched or marred exposed surfaces to match original factory finish.

G. Comply with federal (EPA), state, and local regulations for battery handling and disposal. Do not spill battery fluids down plumbing drains. Only use containers safe for transportation marked 'nonspillable.'

3.8 INSPECTION AND TESTING FOR COMPLETION

A. Notify Owner 7 days prior to beginning completion inspections and tests.

B. Notify AHJ and comply with their requirements for scheduling inspections and tests and for observation by their personnel.

C. Provide services of installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.

D. Prepare for testing by ensuring that work is complete and correct; perform preliminary tests as required.

E. Provide tools, software, and supplies required to accomplish inspection, testing, and document results.

F. Perform inspection and testing in accordance with NFPA 72 and requirements of AHJ; document each inspection and test.

G. Correct defective work, adjust for operation, and retest until entire system complies with Contract Documents.

3.9 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals for additional submittals.

B. See Section 017900 - Demonstration and Training for additional requirements.

C. Closeout Demonstration: Demonstrate operation of all functions to Owner.

1) Be prepared to conduct any of required tests.

2) Have minimum one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.

3) Have authorized technical representative of FACU manufacturer present during demonstration.

4) Demonstration may be combined with inspection and testing required by AHJ; notify AHJ with enough time to schedule demonstration.

5) Repeat demonstration until successful.

D. Substantial Completion of project cannot be achieved until inspection and testing is successful and the following:

1) Approved operating and maintenance data has been delivered.

2) All aspects of operation have been demonstrated to Owner.

3) Final acceptance of fire alarm system has been given by AHJ.

4) Occupancy permit has been granted.

3.10 MAINTENANCE

A. Provide to Owner as alternate to base bid separate maintenance contract for service and maintenance of fire alarm system for entire warranty period to include work described below; include complete description of preventive maintenance, systematic examination, adjustment, inspection, and testing, with detailed schedule.

B. Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:

1) Maintenance of fire safety interface and supervisory devices connected to fire alarm system.

2) Repairs required, unless due to improper use, accidents, or negligence beyond control of maintenance contractor.

3) Record keeping required by NFPA 72 and AHJ.

C. Provide trouble call-back service upon notification by Owner:

1) Provide on-site response within two hours of notification.

2) Include allowance for call-back service during normal working hours at no extra cost to Owner.

3) Owner will pay for call-back service outside of normal working hours on hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

D. Provide complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with detailed schedule.

E. Maintain on-site log listing date and time of each inspection and call-back visit, condition of system, nature of trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.

F. Comply with Owner's requirements for access to facility and security.

**END OF SECTION**

# SECTION 31 1000 - SITE CLEARING

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Clear and grub the site as shown on the Drawings and specified in this Section.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 31 2000: Earthwork.
3. Section 02 4100: Selective demolition.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

A. Provide materials, not specifically described but required for proper completion of the work of this Section, as selected by the Contractor subject to the approval of the Architect.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 PROTECTION

A. Protect existing utilities indicated or made known.

B. Protect trees and shrubs, where indicated to remain, by providing a fence around the tree or shrub of sufficient distance away and of sufficient height so trees and shrubs will not be damaged in any way as part of this Work.

C. Protection of persons and property:
1. Barricade open depressions and holes occurring as part of this Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this Section.
4. Barricade and post or backfill all open trenches outside of fenced areas when not on job site.

D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

E. Maintain access to the site at all times.

3.3 CLEARING

A. Prior to earthwork operations, strip entire site of vegetation, organic topsoil. Clear surface and subsurface obstructions and miscellaneous debris from the proposed building, exterior concrete, and paving areas.
   1. Stripping: Approximately 4" deep. The actual depth of stripping will be reviewed by the responsible inspecting Geotechnical Engineer.

B. Clear organic matter, vegetation, rubbish, debris, and loose soil deposits from the banks and bottoms of the irrigation canal and ditch.

3.4 CONSERVATION OF TOPSOIL

A. Stockpile the stripped organic topsoil in an area clear of new construction in order to provide topsoil for areas shown on the Drawings to be turfed or planted, and to fill planters, without contamination with subsoils.

B. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.
   1. Maintain stockpile free from debris and trash.
   2. Keep the topsoil damp to prevent dust and drying out.

3.5 DISPOSAL

A. Remove brush, grass, roots, trash, and other material from clearing operations. Dispose of away from the site in a legal manner.

B. Do not store or permit debris to accumulate on the job site.

C. Dispose of any excess topsoil after fine grading has been accepted by the Architect.

D. Do not burn debris at the site.

E. Excavated Soils and Land Clearing Debris: 100% of trees, stumps, rocks, and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled, except for reuse, either on site or off site of vegetation or soil contaminated by disease or pest infestation.
   1. Refer to Section 01 7425.

3.6 UTILITIES

A. Coordinate with utility companies and agencies as required. See Section 02 3100.

B. Where utility cutting, capping, or plugging is required, perform such work in accordance with requirements of the utility company or governmental agency having jurisdiction.

**END OF SECTION 31 1000**

**SECTION 31 2000 - EARTHWORK**

**PART 1 - GENERAL**

1.1 SUMMARY

A. In accordance with pertinent provisions of this Section, trench, excavate, fill, backfill, compact, and grade the site to the elevations shown on the Drawings and as needed to meet the requirements of the construction shown in the Contract Documents.

B. The work of this Section includes, but is not limited to, the following:
1. Preparation of sub-grade for buildings, walks, pavements, and landscaping.
2. Site grading, cut, fill, and finish, off-haul or import of soil necessary to meet finish grades indicated on the Drawings.
3. Excavation, backfill and compaction for filling construction and trenches.

C. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 01 4520: Testing and inspection requirements.
3. Section 01 5725: Storm Water Pollution Protection Plan.
4. Section 01 7120: Field engineering.
5. Section 22 0000: Excavation and backfill for plumbing work.
6. Section 26 6000: Excavation and backfill for electrical work.
7. Section 31 1000: Site clearing, removal and storage of top soil.
8. Section 31 3115: Termite control.

1.2 QUALITY ASSURANCE

A. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

B. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the geotechnical engineer.

C. Verify all grade and trench elevations as specified in Section 01 7120.

D. All improvements within property owned by a City, County or State Entity shall be in accordance with the Standard Specifications of the authority having jurisdiction.

1.3 TRENCHING AND EXCAVATION SAFETY

A. All trenches and excavation in excess of 4'-0" in depth and areas of visibly unstable soils shall be shored or otherwise stabilized in conformance with current local or state codes, ordinances and requirements. In addition, the Contractor shall notify the Owner of suspected hazardous waste or other unusual physical conditions as provided by law.

B. All open trenches and excavations outside the fenced construction area shall be properly barricaded for public and worker safety. Trenches shall be adequately covered or backfilled prior to ceasing work or leaving the work site.

C. Slope height, slope inclination, and excavation depths (including utility trench excavations) must in no case exceed those specified in local, state, or federal safety regulations, (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations).

1.4 EXISTING UTILITIES

A. Field verify the location of all existing underground utilities prior to beginning any earthwork. Work around and protect all existing utilities during the course of the Work. Raise or lower each existing utility box flush with new finish surface.

B. Where existing utilities are indicated on the drawings, extreme care shall be exercised in excavating near these utilities to avoid damage, and the Contractor will be held responsible for any damage caused by construction operations.

C. Should utilities not indicated on the drawings be found during construction, the Contractor shall promptly notify the Architect for instructions as to further action. Failure to do so will make the Contractor liable for any damage arising from construction operations after discovery of these utilities.

**PART 2 - PRODUCTS**

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 SOIL MATERIALS

A. Fill and Backfill Materials: Fill shall consist of select material. Native soil, free from organic matter and rocks or cobbles larger than 3", may be used as fill at the site as follows:
   1. Satisfactory Soil Materials: Are defined as those complying with ASTM D2487 Soil Classification Groups GW, GP, GM, SM, SW, and SP.
   2. Unsatisfactory Soil Materials: are defined as those complying with ASTM D2487 Soil Classification Groups GC, SC, MH, ML, CL, CH, OL, OH, and PT.

B. Import Material: Import material, if required, shall consist of homogenous, non-corrosive, non-expansive, inorganic granular soils free of toxic materials and conforming to the following criteria:
   1. Gradation:
      a. 3" Sieve: 100% passing
      b. 3/4" Sieve: 90-100% passing
      c. No. 4 Sieve: 60-100% passing
      d. No. 200 Sieve: 20-50% passing
   2. Plasticity Index, ASTM D4318:
      a. Liquid limit: < 25
      b. Plasticity index: ≤ 10
   3. Expansion Index: ≤ 20
   4. Organic Content: < 2% by dry weight.
   5. Minimum "R" Value (pavement area): 50
   6. Corrosivity:
      a. pH: 6 to 8.5
      b. Minimum resistivity (ohm-cm): > 5,000
      c. Soluble sulfate (mg/kg): < 1,000

d. Soluble chloride (mg/kg): < 200

7. Import fill material shall be approved by the geotechnical engineer prior to transport to the site and provided at no additional cost to the Owner.

C. Engineered Fill Materials:
1. Satisfactory Soil Materials as defined in paragraph 2.2.A.1 above, or
2. Import Material defined in 2.2.B above.

D. Sand for Utility Bedding: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.

E. Toxic Testing of Import Fill Material:
1. The Contractor shall notify the Owner, Architect, and Testing Laboratory for the project, of the location and origin of all fill material intended for this project. Such notification shall be not less than 21 days prior to transport of the material.
2. Both native and stockpile soils shall be subject to testing to determine suitability of the soil as related to toxic substances on school sites.
3. The Owner will pay for only one passing test from one import source. Additional tests, and retests of failed material shall be paid by the Contractor.
4. Should testing indicate toxic substances at levels above those acceptable on school sites by the State of California, Department of Toxic Substance Control (DTSC), the subject soil will not be permitted on the proposed school site.
5. Any delay caused by materials found not to be compliant, shall not be accepted as justification for contract time extension or related claims.

2.3 TOPSOIL

A. Topsoil:
1. Friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoils, roots, heavy or stiff clay, stones and gravel, noxious weeds, sticks, brush, litter, and other deleterious matter.
2. Provide from stockpile developed on site as specified in Section 31 1000.

2.4 ACCESSORY MATERIALS

A. Utility Identification Tape: 2" wide metallic plastic material inscribed with caution message related to the buried utility below (i.e., **ELECTRICAL LINE BURIED BELOW, SEWER LINE BURIED BELOW**, etc.) by McMaster-Carr or approved equal.

B. Provide a dry, free-flowing, dust-free chemical compound, soluble in water, capable of inhibiting growth of vegetation, and approved for use on this Work by governmental agencies having jurisdiction.

**PART 3 – EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISH ELEVATIONS AND LINES

A. Comply with pertinent provisions of this Section, Section 01 7120, and the Grading Plan.

3.3 DEWATERING AND WATER CONTROL

A. Water Control:
1. Establish and construct storm drainage features at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils.
2 Completely drain construction site during periods of construction to keep soil materials sufficiently dry.
3. Temporary excavations for the project construction should be left open only for as short a time as possible and should be protected from water runoff.

B. Dewatering:
1. Remove all water, including rain water, encountered during trench and substructure work to an approved location by pumps, drains, and other approved methods.
2. Keep excavations and site construction area free from water.
3. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
4. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations.
5. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from open excavations, unfinished fills, or other low areas to prevent softening of exposed surfaces.
6. Dispose of water away from the work in a suitable manner without damage to adjacent property or menace to public health.
7. Protect existing storm drain system from silt and debris resulting from construction activities. If contamination occurs, remove contamination at no cost to the Owner.

C. Unsuitable Soil Support: When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified.

3.4 DUST CONTROL

A. The San Joaquin Valley Air Pollution Control District regulates all dust control and emission standards throughout the Central Valley. Regulation VIII – Fugitive PM10 Prohibitions requires that a Dust Control Plan be completed for a large majority of construction projects.

B. This project is less than 5.0 acres, thus a Dust Control Plan is not required.

C. A Construction Notification form shall be submitted to the San Joaquin Valley Air Pollution Control District at least 48 hours prior to commencing any earthmoving activities. A copy of the Construction Notification form is provided at the end of this section.

D. Whether a Dust Control Plan is required for the project or not, the Contractor shall be responsible for complying with the requirements of Rule 8021

3.5 PROCEDURES

A. Utilities:
1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Architect and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Utility Company.

B. Protection of Persons and Property:
1. Barricade open holes and depressions occurring as part of this Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

D. Maintain access to adjacent areas at all times.

3.6 BORING

A. Provide mechanical boring equipment to bore under existing asphalt, concrete, or other surfaces or objects as noted on the drawings. All borings shall be a minimum of 24" under the substrate material unless otherwise authorized by the Architect.

B. Holes shall be bored not to exceed 1" larger diameter than the largest component remaining in the excavation.

C. **Water or air pressure jetting** are not permitted, unless they comply with the following requirements.
1. All surfaces of the hole can be visually inspected with 6' maximum length and,
2. All objects shall be supported continuously to prevent sagging and,
3. The hole shall be filled with compacted damp sand and inspected by the Project Inspector or Materials Testing Lab technician.

D. Comply with requirements of Section 01 7330.

3.7 SITE PREPARATION

A. Over-excavation and Preparation at Concrete Flatwork areas:
1. After removal of existing surface hardscape improvements, excavate native soils to proposed concrete subgrade elevations, in an area extending a minimum of 2'-0" beyond the edge of the proposed improvements or up to existing improvements.
2. Remove roots and other vegetation remaining in excavated area which are larger than ½" in diameter.
3. Scarify bottom of excavation to minimum depth of 12".
4. Bring moisture conditions to 2 percent above optimum moisture content and compact excavated area to a minimum of 90% of maximum dry density; ASTM D1557.

5. Place engineered fill materials required to establish finish grade in lifts no greater than 8" loose depth and compact to a minimum of 90% of maximum dry density; ASTM D1557.

B. Root Removal at Trees:
1. Completely remove root systems to a minimum depth of 24" below the bottom of the lowest structure or footing or 36" below finished subgrade, whichever is lower.
2. Excavate root systems deeper than the elevation indicated above to allow no roots larger than 2" in diameter.
3. Treat roots remaining in the soil with a weed killer approved by the State of California for that purpose.
4. Backfill cavities resulting from root removal with earth materials placed and compacted as required by this Section.

3.8 EXCAVATION

A. Perform excavation of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated and specified herein.

B. Earth excavation includes excavation of pavements and other obstructions visible on ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.

C. Rock excavation in trenches and pits includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42" wide bucket on a track-mounted power excavator equivalent to Caterpillar Model 215, rated at not less than 90 HP flywheel power and 30,000 lb. drawbar pull. Trenches in excess of 10'-0" in width and pits in excess of 30'-0" in either length or width are classified as open excavation.

D. Surplus Materials: Dispose of unsatisfactory excavated materials, and surplus satisfactory excavated material, away from the site at disposal areas arranged and paid for by the Contractor.

E. Additional Excavation: When excavation has reached required subgrade elevations, notify Architect who will make an inspection of conditions. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect/Engineer. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

F. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

G. Unauthorized Excavation:
1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Architect or the geotechnical engineer.
2. Under footings, foundations, or retaining walls:
   a. Fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.
   b. When acceptable to the geotechnical engineer, lean concrete (minimum 2000 psi) may be used to bring bottom elevations to proper position.
3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the geotechnical engineer.

H. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key fill material to slope for firm bearing.

I. Stability of Excavations:
1. Slope sides of excavation to comply with local codes and ordinances having jurisdiction.

2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.
3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

J. Shoring and Bracing:
1. Provide materials for shoring and bracing as may be necessary for safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
2. Maintain shoring and bracing in excavations regardless of the time period excavations will be open.
3. Carry shoring and bracing down as excavation progresses.

K. Use of Explosives: **NOT PERMITTED**.

3.9 FILLING AND BACKFILLING

A. Backfill excavations as promptly as progress of the Work permits, but not until:
1. Acceptance of construction below finish grade:
2. Inspecting, testing, approving, and recording locations of underground utilities;
3. Concrete formwork is removed;
4. Shoring and bracing are removed, and voids have been backfilled with satisfactory materials;
5. Trash and debris have been removed; and
6. Horizontal bracing is in place on horizontally supported walls.

B. Placing and Compaction:
1. Place backfill and fill materials in layers not more than 8" in loose depth.
2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
3. Compact each layer to required percentage of maximum density for the area.

C. Moisture Content:
1. When the moisture content of fill material is below the lower limit specified by the Geotechnical Engineer, add water until the moisture content is as specified.
2. When the moisture content of fill material is above the upper limit specified, the material shall be aerated by blading or other satisfactory methods until the moisture content is as specified.
3. Do not place, spread, or compact fill while it is frozen or thawing or during unfavorable weather conditions. When work is interrupted by weather conditions, do not resume fill operations until moisture content and density of previously placed fill are satisfactory.
4. Where soil has been softened or eroded by flooding, by placement during unfavorable weather, remove damaged areas and recompact as described for fill and compaction.
5. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
6. Where subgrade is spongy or pumping due to conditions beyond the Contractor's control, and aeration or other methods do not bring moisture content within specified levels, stop work and contact the Architect and Geotechnical Engineer for further direction.

3.10 TOPSOIL

A. Place topsoil to the following compacted thicknesses:
1. Areas to be seeded: 6"
2. Areas to be sodded: 4"
3. Shrub beds: 18"
4. Flower beds: 12"

B. Topsoil Placement:
1. Where topsoil is to be placed, scarify surface to depth of 6".
2. Place topsoil during dry weather.

3. Remove roots, weeds, rocks, and foreign material while spreading.
4. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.
5. Roll placed topsoil.

3.11 TRENCHING

A. Trenching:
1. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
2. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
3. Do not interfere with 45 degree bearing splay of foundations.
4. Cut trenches wide enough to allow inspection of installed utilities.
5. Hand trim excavations. Remove loose matter.
6. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.
7. Remove lumped subsoil, boulders, and rock up to 1.0 cu yd measured by volume.
8. Remove excavated material that is unsuitable for re-use from site.
9. Stockpile excavated material to be re-used in area designated on site in accordance with this Section 31 2000.
10. Remove excess excavated material from site.

B. Preparation for Utility Placement:
1. Cut out soft areas of subgrade not capable of compaction in place. Backfill with engineered fill.
2. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
3. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

C. Backfilling:
1. Backfill to contours and elevations indicated using unfrozen materials.
2. Employ a placement method that does not disturb or damage other work.
3. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
4. Maintain optimum moisture content of fill materials to attain required compaction density.
5. Slope grade away from building. Make gradual grade changes. Blend slope into level areas.
6. Correct areas that are over-excavated.
7. Reshape and re-compact fills subjected to vehicular traffic.

D. Utility Installation: Install underground utilities according to the manufacturer's written recommendations. In addition to the manufacturer's recommendations, install underground utilities as follows:
1. Underground Utility Line Cover: No less than 12".
2. Bedding: Minimum of 6" compacted sand bedding under the pipe or conduit.
3. Envelope: Compacted sand extending 6" above and around the pipe or conduit.
4. Backfill Material: Remaining backfill material may consist of native soil or engineered fill material as described above.
5. Place and compact utility trench backfill in accordance with the requirements for engineered fill.

E. Utility Identification:
1. Utility Identification Tape: 2" wide metallic plastic material inscribed with a CAUTION message related to the buried utility.
2. Identify each utility pipe or conduit by the use of a continuous underground warning tape.
3. Locate tape 12" directly above the pipe or conduit, but not more than 12" below or not less than 6" below the finished grade.
    a. Where the top of the pipe or conduit exceeds 4'-0" below finish surface, locate one tape 12" directly above the pipe or conduit and one tape not less than 6" below the finished grade.

4. Provide one strip of identification tape for each 18" of trench width, horizontally.

3.12 GRADING

A. General: Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas. Smooth the finished surfaces within specified tolerance.

B. Finish Grading Outside Building Lines:
   1. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
   2. Finish the surfaces to be free from irregular surface changes, and:
      a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 foot above or below the required subgrade elevation.
      b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.10 feet above or below the required subgrade elevation.
      c. Shape finish grade adjacent to building to slope a minimum of 2% away from the exterior footings and wall, for a distance of 5'-0".

3.13 COMPACTION

A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557.

B. Moisture Control: Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.

C. Densities: Provide not less than the following maximum density of soil material compacted at each layer of soil material in place, and as approved by the geotechnical engineer.
   1. **Site Concrete:** As specified in paragraph 3.7.
   2. **Lawn and unpaved areas:** Compact the top 6" of subgrade and each layer of fill material or backfill material at 85% of maximum density;
   3. **Trenches:** Provide a minimum of 6” of compacted sand bedding under pipe or conduit and provide envelope extending 12" above pipe or conduit. Compact remaining backfill to 90% of maximum density except the upper 24" of those trenches located within structures, walks, and pavement areas which shall be compacted as specified in section 3.7 or project drawings.

3.14 FIELD QUALITY CONTROL

A. Secure the Geotechnical Engineer's inspection and approval of subgrades and fill layers before subsequent construction is permitted thereon.

B. The Owner's testing laboratory will provide at least the following tests:
   1. At paved areas, at least 1 field density/moisture test for every 10,000 sq. ft. of paved area, but not less than 3 tests.
   2. In each compacted underlying fill layer, 1 field density/moisture test for every 7,500 sq. ft. of overlaying paved area, but not less than 3 tests.
   3. In building areas, at least 1 field density/moisture test for every 2,000 sq. ft. of building coverage.
   4. At least 1 field density/moisture test per every 200 lineal foot of trench over 3'-0" of trench depth.

C. If, in the Geotechnical Engineer's opinion based on reports of the testing laboratory, subgrade or fills which have been placed are below specified density, provide additional compacting and testing under the provisions of Section 01 4520 of these Specifications.

**END OF SECTION 31 2000**

## SECTION 32 01 90 - EXISTING LANDSCAPE PROTECTION

## PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This Section includes but is not limited to the following:
   1. Protection and maintenance of existing trees and other plants that are affected by the execution of the Work, whether temporary or new construction.

B. Related Work Specified Elsewhere
   1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.
   2. Section 32 84 00: Irrigation System
   3. Section 32 90 00: Landscape Planting

1.2 SUBMITTALS

A. Product Data: For each type of product indicated or proposed for use.

B. Qualification Data: Submit arborist's certification and/or license information. Submit qualifications and experience of the certified tree worker if not the arborist.

C. Project Certification: Provide a certification letter from the consulting arborist that trees indicated to remain have had their Tree Protection Zone (TPZ) protected during construction according to these specifications and/or the arborist's recommendations. Provide a list of any trees damaged during construction and the subsequent treatment and repair.

D. Transplanting and Maintenance Recommendations: Submit transplanting, maintenance and protection specifications from a qualified arborist for care and protection of trees during and after completion of the Work that are likely to be affected by construction operations. The tree maintenance recommendations shall be included in the Maintenance Manuals required in 329000.

E. Tree Assessment and Valuation: Prior to the start of any construction operations of any kind, submit a tree assessment including tree valuation for existing trees scheduled to remain in the area of work or in auxiliary construction areas.
   1. Tree valuation for trees species that do not have comparable and available replacement sizes shall be determined by a certified consulting arborist experienced in tree valuation using the "Guide for Establishing Values of Trees and Other Plants", current edition, published by the International Society of Arboriculture, Urbana, Illinois.
   2. Tree assessment shall include a physical description, health, condition and recommended pruning and/or mitigation measures based on the expected construction operations to minimize the negative impacts to the affected trees.

1.3 QUALITY ASSURANCE

A. Tree Service Qualifications: An experienced tree service firm that has successfully completed tree protection and/or relocation work similar to that required for this Project, and who will provide experienced, certified tree workers.

B. Arborist Qualifications: The arborist shall be certified by the International Society of Arboriculture. If the arborist is performing tree work, he/she shall be employed by a licensed contractor, or shall hold an individual license if independent.

C. Tree Pruning Standards: Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance--Standard Practices," unless more stringent requirements are indicated or recommended by the certified arborist.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.

B. Topsoil: See Section 32 93 00.

C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers, minimum 4.8 oz/sq. yd.

D. Temporary Fencing at the TPZ: Heavy-duty exterior rated plastic or chain link fencing, minimum four feet high with stakes at a maximum 10 feet on-center or as needed for a taut installation.

E. Wood mulch: Walk-on type chipped wood and aged greenwaste material without leaves, green wood, sticks, dirt, dust, construction materials and other debris. Particle size 1/2” to 3" in general size.

F. Coarse sand: Clean sand with greater than 95% passing a #10 seive, less than 5% passing a #30 seive, and less than 1% passing a #50 seive.

2.2 TEMPORARY TPZ FENCING TYPES

A. TPZ 1: Temporary fencing shall be installed at the drip line of the tree canopy. Where the canopy extends into remaining or proposed hardscaped areas, the posts may be supported by appropriate on-grade concrete or weighted bases.

B. TPZ 2: Where existing trees are in planting strips with active walkways and/or roadways in the TPZ, the temporary fencing shall extend to the edge of the hardscaped areas to keep the walkways and/or roadways open.

C. TPZ 3: Existing trees remaining in small planters or tree wells shall be wrapped with a minimum 2 inch thickness of orange plastic construction fencing from the ground to the first scaffold branch, or 4 feet high, whichever is greater. The wrapped section shall be covered with vertical 1.5 inch square slats and bound around the trunk firmly at least every 2 feet. Use caution when installing the slats so that the tree bark is not damaged.

**PART 3 - EXECUTION**

3.1 PREPARATION

A. Temporary Fencing: Install temporary fencing located around the canopy drip line of trees (the tree protection zone [TPZ]), and around the plants scheduled to remain that are inside the construction area. The TPZ fence layout shall be reviewed for acceptance by the Owners Representative and the consulting arborist.

B. All work within the TPZ shall be reviewed and monitored by the consulting arborist.

C. Within the TPZ, install a 4 inch depth of wood mulch over a permeable filter fabric with minimum 4 inch overlaps at fabric seams. Remove the protection mulch and fabric prior to any cultivation and amendment tillage.

D. Provide a temporary dirt berm watering basin around trees and plants scheduled to remain. The berm around trees shall be a minimum diameter of six times (6x) the diameter of the tree at breast height (DBH), or not less than six feet in diameter, whichever is greater.

E. Provide temporary irrigation or a portable water source to irrigate trees and plants scheduled to remain. Irrigate at minimum once a week or more often as necessary to moisten soil to a minimum 18 inch depth for trees, and a minimum depth of 12 inches for shrubs. Reapply irrigation based on an evapotranspiration loss of 50%.

F. Protect plant/tree root systems within the protected fenced areas from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.

G. Do not store construction materials, debris, or excavated material within the TPZ. Do not permit vehicles or reoccuring foot traffic within the TPZ to prevent soil compaction over root systems.

H. Do not allow fires under or adjacent to remaining trees or other plants.

3.2 EXCAVATION

A. Do not excavate within the canopy drip line of existing trees unless otherwise authorized. Any excavation within the TPZ shall be performed under the onsite monitoring by the consulting arborist.

B. Where excavation for new construction and/or utility lines are required within the canopy drip line of trees, hand clear and excavate to minimize damage to root systems. Use spading forks to comb soil or use an Air-Spade to expose roots.

C. Where utility lines are to be located within the drip line of trees, expose the existing root system to the depth of utility line installation plus the depth of any required bedding material. Place piping below and/or through the exposed roots without damage to the root system. Backfill with approved material and compact by flooding the area if allowed.

D. As an alternative to manual or Air-Spade trench excavation, utility or other below grade piping may be mechanically bored under the crown dripline with a minimum cover of 3 feet as authorized by the consulting arborist.

E. Root Pruning: Do not cut main lateral roots or taproots greater than one inch in diameter. Smaller roots less than one inch in diameter that interferes with the installation of new improvements and/or utility lines may be cut only if absolutely necessary. Only cut roots with sharp pruning instruments; do not break, tear or chop. Block out concrete footings around roots greater than one inch diameter leaving a minimum one inch clearance around roots to remain. Provide alternative footing design if main lateral roots are in conflict.

3.3 REGRADING

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by the certified arborist, unless otherwise indicated.
   1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots less than one inch diameter. Cut roots with sharp pruning instruments; do not break or chop.

B. Minor Fill: Where existing grade is `12 inches` or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations. Do

not place fill greater than 6 inches in depth within 24 inches of the trunk, and do not cover the trunk/root base flare. Do not allow standing water at the trunk.

C. Moderate Fill: Where existing grade is more than 12 inches , but less than 18 inches below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
   1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of existing grade and extend not less than 20 inches from tree trunk on all sides up to the finish grade. Slope of the rock fill shall be a maximum 2h:1v. For balance of area within drip-line perimeter, place drainage fill a minimum 6 inches in depth.
   2. Place filter fabric over the drainage fill with edges overlapping 6 inches minimum.
   3. Place fill layer of topsoil to finish grade. Do not mechanically compact drainage fill or topsoil more than 85% relative density in planted areas. Hand grade to required finish elevations.

3.4 TREE PRUNING

A. Prune remaining trees affected by temporary and new construction only when authorized by the Landscape Architect and as recommended by the consulting arborist.

B. Prune remaining trees to compensate for root loss caused by damaging or cutting root system only when authorized by the Landscape Architect and as recommended by the consulting arborist. Provide subsequent maintenance during Contract period as recommended by the consulting arborist.

C. Pruning Standards: Prune trees according to ANSI A300 based on pruning for access clearance, to correct any defects in structure, or to remove potential conflicts with new improvements. Pruning shall only be performed by a Certified arborist or tree worker.

D. Cut branches with sharp pruning instruments; do not break or chop. Clean pruning tools with a diluted bleach solution prior to performing any pruning operations.

3.5 TREE Repair And REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to written instructions of the arborist.

B. Remove and replace dead and/or damaged trees impacted by the construction operations that the arborist determines to be incapable of restoring to a normal growth pattern.
   1. Provide new trees of the same size and species as those being replaced; plant and maintain as specified in 32 90 00.
   2. When new trees of the same size and species are not available, furnish and install the largest size boxed tree that is readily available and will successfully grow in the planting area with long term health and without damage to adjacent improvements. Credit the Owner the difference between the valuation of the removed existing tree and the installed replacement tree.

C. Aerate surface soil within any existing Oak tree dripline compacted before or during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch-diameter holes a minimum of 18 inches deep at 36 inches o.c. Backfill holes with coarse sand. Manually till the top 4 inches with a spading fork, and break up clods greater than 1 inch diameter. Smooth grade prior to installing wood mulch.

3.6 CLEAN-UP

A. Burning is not permitted.

B. Prior to Final Acceptance, remove the TPZ fence, stakes and other related materials.

C. Legally remove excess excavated material, debris, displaced trees, and greenwaste from Owner's property. Broom clean all hardscape surfaces in the area of work.

END OF SECTION

**SECTION 32 1210 - ASPHALT PAVING**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide asphalt paving, aggregate base, and wheel stops where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1. The Work of this Section includes patching and repair of asphaltic concrete paving removed for installation of underground utilities.
2. The work of this Section includes patching and repair of asphaltic concrete paving removed for installation of new work.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 31 2000: Earthwork
3. Section 32 1720: Pavement Marking

1.2 COMPENSATION FOR ASPHALT OIL

A. The compensation payable for asphalt oil will be increased or decreased in conformance with the provisions of this section for fluctuations in crude oil prices exceeding 5 percent higher or lower than the price index at the time of bid.

B. The adjustment in compensation in each monthly billing will be determined in conformance with the formulae indicated in Exhibit A attached at the end of this section.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 3300.
1. Manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Certificates, signed by the asphaltic concrete paving materials producer and the asphaltic concrete paving subcontractor, stating that materials meet or exceed the specified requirements.

1.4 QUALITY ASSURANCE

A. All improvements within property owned by a City, County or State Entity, shall be in accordance with the Standard Specifications of the authority having jurisdiction.

1.5 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, provide a material and workmanship warranty signed by an authorized representative of the installing subcontractor and cosigned by the Contractor with an extended warranty correction period of 2-years.

**PART 2 - PRODUCTS**

2.1 GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 6200.

B. All materials and products shall be in conformance with the current construction standards and construction specifications of the governing jurisdiction.

2.2 ASPHALT CONCRETE

A. Asphalt Concrete: Type B; Standard Specifications Section 39, California Department of Transportation, 2010 edition.

B. Aggregate: 1/2" maximum (medium).

C. Asphalt Binder: Steam refined paving asphalt classified as PG 64-10; Section 92 of the State of California Standard Specifications, 2010 edition.

2.3 AGGREGATE BASES, SUBBASES, AND RECYCLED BASES

A. Aggregate Bases:
1. Class 2 conforming to Section 26 of the Caltrans Specifications, 2010 edition.
2. Gradation: As specified for 3/4" maximum aggregate.

B. Aggregate Subbase:
1. Conform to Section 25 of the Caltrans Specifications, 2010 edition.
2. Class as noted on the Drawings.

C. Recycled Base and Subbase Courses: Aggregate base or subbase may be composed of salvaged oiled earth and asphalt concrete from the existing roadway recycled and mixed with imported materials to meet the requirements of the base or subbase class noted on the Drawings.
1. Contractor shall be responsible for paying for “R” Value testing and other required testing of the salvaged materials.
2. Contractor must show that “R” Value and other properties of the salvaged material meets or exceeds the requirements of the base or subbase class noted on the Drawings.
3. The amount of recycled/reclaimed material in the mix may be up to 100 percent of the total volume of the aggregate used.

2.4 OTHER MATERIALS

A. Weed Killer: SFM 75 by Alligare.

B. Wheel Stops: 6"x6"x48" reinforced precast concrete with two 3/4"x24" steel anchor pins set in epoxy.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINAL PREPARATION OF SUBGRADE

A. After preparation of subgrade as specified in another Section of these Specifications, thoroughly scarify and sprinkle the entire area to be paved, and then compact to a smooth, hard, even surface of 95% compaction to receive the aggregates.

B. Apply the specified weed killer to the entire area to be paved. Adhere to the manufacturer's application recommendations.

3.3 PLACEMENT OF BASE COURSES

A. Base:
1. Spread specified base material to a thickness providing the compacted thickness indicated.
2. Place in lifts not exceeding 8" in thickness.
3. Compact to 95%.

B. Moisture Content: Use only the amount of moisture needed to achieve the specified compaction.

3.4 PLACEMENT OF ASPHALTIC CONCRETE PAVING

A. Install the specified headers and stakes to achieve the arrangement of paving indicated.

B. Remove all loose materials from the compacted base.

C. Apply the specified prime coat, and tack coat where required, and allow to dry, in accordance with the manufacturer's recommendations.

D. Adjust frames and covers, if so required, to meet final grades.

E. Receipt of Asphaltic Concrete Materials:
1. Do not accept material unless it is covered with a tarpaulin until unloaded, and unless the material has a temperature of not less than 280 degrees F.
2. Do not commence placement of asphaltic concrete materials when the atmospheric temperature is below 50 degrees F, nor during fog, rain, or other unsuitable conditions. Begin placement only when temperature is above 51 degrees F **and rising**.

F. Spreading:
1. Spread material in a manner which requires the least handling.
2. Where thickness of finished paving will exceed 2.5", spread in two or more layers, with top layer no thinner than 1.5". No lift shall exceed 2.5".
3. Provide compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".

G. Rolling:
1. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.
2. Roll in at least two directions until no roller marks are visible.
3. Finished paving smoothness tolerance:
    a. Free from birdbaths.
    b. No deviations greater than 1/8" in 6 feet.
    c. Compact to a maximum relative compaction of 97%, with no single test value being below a minimum relative compaction of 91% based on a 50 blow Marshall maximum density.
    d. **Percentage of voids shall not exceed 9%**

3.5 FLOOD TEST

A. Perform a flood test in the presence of the Architect.

B. Method: Flood the entire asphaltic concrete paved area with water by use of a tank truck or hoses.
   1. If a depression is found where water ponds to a depth of more than 1/8" in six feet, fill or otherwise correct to provide proper drainage.
   2. Feather and smooth the edges of fill so that the joint between fill and original surface is invisible.

3.6 INSTALLING WHEEL STOPS

A. Install the specified precast concrete wheel stops as shown on the Drawings, driving the approved 3/4" dia. anchor pins not less than 2'-0" through the paving into the earth.

3.7 FIELD QUALITY CONTROL

A. Secure the geotechnical engineer's inspection and approval of subgrades before subsequent construction is permitted thereon.

B. In-Place Density: Owner's testing laboratory will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
   1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D1188 or ASTM D2726.
      a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
      b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D2950 and correlated with ASTM D1188 or ASTM D2726.

C. In-place Compacted Thickness: Owner's testing laboratory will determine compacted thickness according to ASTM D3549.

D. Repair or remove and replace unacceptable paving as directed by the Architect.

E. Replace and compact asphalt where core tests were taken.

**END OF SECTION 32 1210**

# EXHIBIT "A"

## COMPENSATION ADJUSTMENTS FOR CRUDE OIL PRICE INDEX FLUCTUATIONS

The compensation payable for asphalt oil will be increased or decreased in conformance with the provisions of this Exhibit "A" for crude oil fluctuations more than 5 percent higher or lower than the price index at the time of bid.

The adjustment in compensation will be determined In conformance with the following formula:

**DETERMINE ASPHALT QUANTITIES:**

Calculate the quantity of asphalt oil in hot mix asphalt using the following formula:

*Qh = HMATT x [Xa / (100 + Xa)]*

*Qh* = quantity in tons of asphalt oil used in hot mix asphalt

*HMATT* = hot mix asphalt total tons placed

*Xa* = theoretical asphalt oil content from job mix formula expressed as percentage of the weight of dry aggregate

**DETERMINE PAYMENT ADJUSTMENTS:**

If material containing asphalt oil is placed within multiple months, calculate separate adjustments for each month.

Each adjustment is calculated using the price index for the month in which the quantity of material containing asphalt oil subject to adjustment is placed in the work. The sum of all the adjustments is used for increasing or decreasing payment.

Calculate each payment adjustment as follows:

*PA = Qh x A*

*PA* = Payment adjustment in dollars for asphalt oil contained in materials placed in the work for a given month.

*Qh* = quantity in tons of asphalt oil used in hot mix asphalt.

*A* = Adjustment in dollars per ton of asphalt oil used to produce materials placed in the work rounded to the nearest $0.01.

*A = [(Iu / Ib) - 1.05] x Ib x [1 + (T / 100)]* for an **increase** in the crude oil price index exceeding 5%

*A = [(Iu / Ib) - 0.95] x Ib x [1 + (T / 100)]* for a **decrease** in the crude oil price index exceeding 5%

*Iu* = California Statewide Crude Oil Price Index for the month in which the quantity of asphalt oil subject to adjustment was placed in the work.

*Ib* = California Statewide Crude Oil Price Index for the month in which the bid opening for the project occurred

*T* = Sales and use tax rate, expressed as a percent, currently in effect in the tax jurisdiction where the material is placed. If the tax rate information is not submitted timely, the statewide sales and use tax rate is used in the payment adjustment calculations until the tax rate information is submitted.

**ADJUST THE CONTRACT SUM:**

The Contract Sum will be increased or decreased based on the sum of the Payment Adjustments.

If the price index at the time of placement increases:

50% percent or more over the price index at bid opening, notify the Architect.

100% or more over the price index at bid opening, do not furnish material containing asphalt oil until the Architect authorizes the work to proceed. The Owner decrease or eliminate asphalt paving work.

The adjustment shall also be subject to the following:

The Contractor shall be liable to the Owner for decreased compensation adjustments and the Owner may deduct the amount thereof for moneys due or that may become due the Contractor.

In the event of an overrun of contract time, adjustment in compensation for asphalt oil during this overrun period will be determined using the California Statewide Crude Oil Price Index in effect on the first business day of the month within the month in which the overrun began.

**CALIFORNIA STATEWIDE CRUDE OIL PRICE INDEX:**

The California Statewide Crude Oil Price Index is determined each month on or about the 1st business day of the month by the California Department of Transportation using the average of the posted prices in effect for the previous month as posted by Chevron, ExxonMobil, and ConocoPhillips for the Buena Vista, Huntington Beach, and Midway Sunset fields.

If a company discontinues posting its prices for a field, the California Department of Transportation determines the index from the remaining posted prices. The Department may include additional fields to determine the index.

For the California Statewide Crude Oil Price Index, go to:

http://www.dot.ca.gov/hq/construc/crudeoilindex/

**SUBMITTALS:**

Before placing material containing asphalt oil, submit the current sales and use tax rate in effect in the tax jurisdiction where the material is to be placed.

Submit certified weight slips for hot mix asphalt, including those materials not paid for by weight.

## SECTION 32 3115 - CHAIN LINK FENCES AND GATES

### PART 1 - GENERAL

1.1 SUMMARY

A. Provide chain link fence system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 03 3000: Cast-In-Place Concrete

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Shop Drawings: Submit shop drawings of manufacturer's fence system.

### PART 2 - PRODUCTS

2.1 GENERAL

A. Manufacturers: Shall be an active member of the Chain Link Fence Manufacturers Institute.

B. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 MATERIALS

A. Posts, Rails, and Frames: ASTM F1083 Schedule 40 hot-dipped galvanized steel pipe, welded construction, minimum yield strength of 30 ksi.

B. Wire Fabric: ASTM A 392 zinc coated steel chain link fabric.

C. Barbed Wire: Zinc-coated steel, complying with ASTM A121 Type Z Coating Class 1; 2 strands of 0.099 inch diameter wire, with 2-pointed barbs at 4 inches on center.

D. Vinyl Slats: Fit in between woven wire fabric, same height as fence. Color selected by owner.

2.3 COATINGS

A. Hardware: Hot-dip galvanized to weight required by ASTM A153.

B. Accessories: Same finish as framing.

2.4 FABRIC

A. Fabric: 2 inch diamond mesh interwoven wire, 9 gauge thick, top and bottom selvage knuckle end closed.

B. Provide fabric in one piece widths.
   1. Where indicated on the drawings, provide vinyl privacy slats. Color to be selected by Owner.

2.5 POSTS, RAILS, AND ASSOCIATED ITEMS

A. End, Corner, Slope, and Pull Posts: Provide at least the following minimum sizes and weights:
   1. 6'-0" high and under: Pipe, 2.5" nominal, 2.875" outside diameter, 5.79 lbs. per lineal foot.
   2. 8'-0" high and under: Pipe, 3" nominal, 3.500" outside diameter, 7.58 lbs. per lineal foot.
   3. 12'-0" high and under: Pipe, 4" nominal, 4.500" outside diameter, 10.79 lbs. per lineal foot.

B. Line Posts: Provide minimum sizes and weights as follows:
   1. 6'-0" high and under: Pipe, 2" nominal, 2.375" outside diameter, 3.65 lbs. per lineal foot.
   2. 8'-0" high and under: Pipe, 3" nominal, 3.500" outside diameter, 7.58 lbs. per lineal foot.
   2. 12'-0" high and under: Pipe, 4" nominal, 4.500" outside diameter, 10.79 lbs. per lineal foot.
   4. For fencing taller than 12'-0" refer to the plans for post sizes.

C. Gate Posts: Provide gate posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:
   1. 13'-0" wide and under: Pipe, 4" nominal, 4.500" outside diameter, 10.79 lbs. per lineal foot.
   2. Over 13 feet wide, and up to 18 feet wide: Pipe, 6" nominal, 6.625" outside diameter pipe, 18.97 lbs. per lineal foot.
   3. Over 18 feet wide: Pipe, 8" nominal, 8.625" outside diameter pipe, 28.55 lbs per lineal foot.

D. Top Rails:
   1. Pipe, 1.25" nominal, 1.660" outside diameter pipe weighing 2.27 lbs per lin ft; or
   2. Provide in manufacturer's longest lengths, with expansion type couplings approximately 6" long for each joint.
   3. Provide means for attaching top rail securely to each gate, corner, pull, slope, and end post.

E. Post Brace Assemblies:
   1. Provide at end and gate posts, and at both sides of corner, slope, and pull posts, with the horizontal brace located at mid-height of the fabric.
   2. Pipe, 1.25" nominal, 1.660" outside diameter pipe weighing 2.27 lbs per lin ft for horizontal brace.
   3. 3/8" diameter rod with turnbuckle for diagonal truss.

F. Tension Wire: Provide number 7 gauge galvanized coiled spring wire at bottom of fabric.

G. Post Tops:
   1. Provide steel, designed as weathertight closure cap.
   2. Provide one cap for each post.
   3. Provide caps with openings to permit through passage of top rail.

H. Stretcher Bars:
   1. Provide one-piece lengths equal to full height of fabric, with a minimum cross-section of 3/16" x 3/4".
   2. Provide one stretcher bar for each gate and end post, and two for each corner, slope, and pull post, except where fabric is woven integrally into the post.

I. Stretcher Bar Bands:
   1. Provide steel, spaced not over 15" on centers, to secure stretcher bars to end, corner, pull, slope, and gate posts.
   2. Bands may be used also with special fittings for securing rails to end, corner, pull, slope, and gate posts

2.6 GATES

A. General:
   1. Fabricate gate perimeter frames of tubular members.
   2. Provide additional horizontal and vertical members to assure proper operation of the gate, and for attachment of fabric, hardware, and accessories.
   3. Space so frame members are not more than 8 feet apart.
   4. Materials and dimension: Pipe, 1.90 outside diameter.
   5. Weight: 2.72 lbs. per lineal foot.

B. Fabrication:
   1. Assemble gate frames by welding with special malleable or pressed steel fittings and rivets for rigid connections.
   2. Use same fabric as used in the fence.
   3. Install fabric with stretcher bars at vertical edges as a minimum.
   4. Attach stretchers to gate frame at not more than 15" on centers.
   5. Attach hardware with rivets or by other means which will provide security against removal and breakage.
   6. Provide diagonal cross-bracing consisting of 3/8" diameter adjustable length truss rods on gates where required to provide frame rigidity without sag or twist.

C. Gate Hardware: Provide following for each gate:
   1. Hinges:
      a. Pressed or forged steel, “bulldog” type hinge allowing 180 degree opening.
      b. Provide 1-1/2 pr. of hinges for each leaf over 6 feet in nominal height.
   2. Latches:
      a. Provide forked type or plunger-bar type to permit operation from either side of the gate.
      b. Provide padlock eye as integral part of latch.
      c. Delete any cane bolts or padlocks and provide panic hardware and other accessible hardware for all gates in exit discharge or accessible routes.
   3. Keeper: Provide keeper for vehicle gates, which automatically engages the gate leaf and holds it in the open position until manually released.
   4. Double gates:
      a. Provide gate stops for double gates consisting of mushroom or flush plate, with anchors.
      b. Set in concrete to engage the center drop rod or plunger bar.
      c. Provide locking device and padlock eyes as an integral part of the latch, requiring one padlock for locking both gate leaves.
   5. Rolling gates: Provide manufacturer's standard heavy-duty inverted channel track, ball-bearing hanger sheaves, dual rubber wheels, overhead framing and supports, guides, stays, bracing, hardware, and accessories as required.

2.7 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Wire Ties:
   1. Fabric to Line Posts: 9 gauge wire ties spaced 12" on centers.
   2. Fabric to Rails and Braces: 9 gauge wire ties spaced 24" on centers.
   3. Fabric to Tension Wire: 11 gauge hog rings spaced 24" on centers.
   4. Manufacturer's standard wire ties will be acceptable if of equal strength and durability.
B. Concrete: Comply with provisions of Section 03 3000 for 2500 psi concrete.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:
1. Install posts at a maximum spacing of 10 feet on centers.
2. Install corner or slope posts where changes in line or grade exceed a 30 degree deflection.
3. Provide and install fencing, posts, fabric and accessories in accordance with industry standards.
4. Do not, in any case, install fabric or accessories in less than 7 days after placement of concrete.
5. **Chain link fabric shall not exceed the top rail by more than ½".**
6. Adjust accessible gates to open with not more than 5.0 lbs. pressure, as allowed per California Building Code, Section 11B-404.2.9.

B. Excavation:
1. Drill holes for post footings in firm, undisturbed or compacted soil, strictly adhering to the dimensions and spacing shown.
2. Post hole dimensions:
   a. Provide as indicated in the plans. Provide 36" deep by 12" diameter foundations for all other posts.
3. Spread soil from excavations uniformly adjacent to the fence line, or on adjacent areas of the site if so directed.
4. When solid rock is encountered near the surface, drill into rock at least 12" for line posts and at least 18" for end, pull, gate, and corner posts. Drill hole at least 1" greater diameter than the largest dimension of the post to be placed.
5. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths specified above.

C. Miscellaneous:
1. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns.
2. Bend ends of wire to minimize hazards to persons and clothing.
3. Fasteners:
   a. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
   b. Peen the ends of bolts to prevent removal of nuts.
4. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as approved by the Architect.

**END OF SECTION 32 3115**

**SECTION 328400 - IRRIGATION SYSTEM**

**PART 1 - GENERAL**

1.1 SCOPE OF WORK

A. Provide all materials, labor, equipment and services necessary to furnish, install and maintain the Irrigation System, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

B. Related Work Specified Elsewhere
1. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections, apply to work of this section.
2. Section 31 23 00 – Trench Excavation and Backfilling
3. Section 32 90 00 – Landscape Planting
4. Division 26 00 00 – General Electrical

1.2 CODES AND REGULATIONS

A. All work and materials shall be in full accordance with the following codes adopted and amended by the authority having jurisdiction. Nothing in these drawings or specifications is to be construed to permit work not conforming to these codes. The work described in these specifications shall govern in the event that the drawings or specifications call for material or methods of construction of higher quality or standard than required by these codes.
1. California Plumbing Code
2. California Administrative Codes:
   a. Title 8, Industrial Relations
   b. Title 19, Public Safety
3. California Electrical Code
4. California Green Building Standards Code, Section 5.304.
5. California Department of Water Resources, Model Water Efficient Landscape Ordinance (MWELO)
6. Standards and Regulations of other agencies, water utility provider, or organizations as listed in this specification relating to products or procedures, e.g. American Society for Testing and Materials.

1.3 DEFINITIONS

A. Piping: All pipe fittings, valves, and accessories as required for a complete irrigation system.

B. PVC: Polyvinyl Chloride.

C. Agencies and Organizations:
1. ASTM- American Society for Testing and Materials
2. AWWA- American Water Works Association
3. IAPMO- International Association of Plumbing and Mechanical Officials
4. CEC - California Electrical Code
5. UL - Underwriter's Laboratories
6. SSPWC – Standard Specifications for Public Works Construction, by the American Public Works Assoc./Associated General Contractors of California.
7. Caltrans – State of California Department of Transportation

D. Owner: An authorized representative of the Owner or the Owner’s authorized consultant.

1.4 QUALITY ASSURANCE

A. The work of this section shall be performed by a single firm experienced in irrigation work and holding a current California Contractor's A or C27 License.

B. Qualifications of Workers
   1. The Contractor shall employ skilled workers who are thoroughly trained and experienced in irrigation system installation and who are completely familiar with the specified requirements and methods needed for proper performance of this work.
   2. The Contractor shall provide adequate supervision by a qualified foreman fluent in English that will be continuously onsite during the performance of this work.

1.5 SUBMITTALS

A. An operational assessment report of any existing irrigation system in the area of work shall be submitted prior to the start of the project's work, including demolition and clearing. See Subsection 1.07.

B. The Contractor shall submit complete lists of proposed materials and equipment per the Division 01 Submittal Section, including manufacturer's name and model numbers. Only provide additional product data and/or catalog cut sheets if a substitute material or equipment is proposed. No substitution will be allowed without prior written approval.

C. Shop drawings shall be provided for the layout and description of all equipment assemblies, including dimensions, capacities, and other characteristics as listed in product specifications. Shop drawings for booster pump assemblies shall clearly and neatly indicate the layout of the assemblies and proposed piping in the pump yard, and shall show adjacent equipment, required clearances, walls, fences, piping and other existing permanent improvements affecting the layout. Materials and equipment shall not be ordered until given written acceptance. Equipment or materials installed or furnished without prior approval or acceptance may be rejected and the Contractor shall be required to remove such materials from the site at his own expense.

D. When specific name brands of equipment and materials are used, they are intended as preferred standards only. This does not imply any right upon the part of the Contractor to furnish other materials unless specifically approved in writing as equal in quality and performance by the Owner. Decisions by the Architect/Engineer shall govern as to what name brands of equipment and materials are equal to those specified on the plans and his decisions shall be final. It shall be the responsibility of the Contractor to furnish proof as to equality of any proposed equipment or material.

E. Approval of any item, alternate or substitute indicates only that the products apparently meet the requirements of the drawings and specifications on the basis of the information or samples submitted. Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.

F. Acceptance of any submittals, deliverables, or other work product of the Contractor shall not be construed as assent that the Contractor has complied with, nor in any way relieved the Contractor of compliance with (i) the applicable standard of care, and/or (ii) applicable statutes, regulations, rules, guidelines, and contract requirements.

G. Irrigation Equipment: When the Contractor desires to transfer salvaged irrigation equipment and/or new spare equipment and/or parts to the Owner, he must submit along with the equipment an itemized list. The Contractor is solely responsible to obtain a written confirmation by the Owner that

all materials received by the Owner matches his material list. The transfer of materials will not be considered executed without written confirmation of same.

H. Submit any required or requested testing data and/or Certificates, including but not limited to the backflow prevention assembly testing Certificate after the assembly is installed prior to regular system operation.

1.6 EXPLANATION OF DRAWINGS

A. The intent of the drawings and specifications is to indicate and specify a complete and efficient sprinkler irrigation system ready for use in accordance with the manufacturer's recommendations, and all applicable local codes and ordinances. Interpretation of irrigation plans and specifications shall be the responsibility of the Landscape Architect or Owner.

B. All existing systems and improvements are shown in their approximate locations. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and shall report any variations to the Owner.

C. Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, etc., which may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all his work, and plan his work accordingly, furnishing such fittings, etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed in the most direct and workmanlike manner, so that conflicts between sprinkler systems, planting, utilities, and architectural features will be avoided. Locate pipe, valves and other equipment in planting areas unless specifically noted otherwise.

D. All work called for on the drawings by notes shall be furnished and installed whether or not specifically mentioned in the specifications.

1.7 EXISTING CONDITIONS

A. The Contractor shall not install the irrigation system and equipment as shown on the Drawings when it is obvious in the field that obstructions or differences in existing conditions and/or systems are present. Such obstructions or differences should be immediately brought to the attention of the Owner. Failure to provide notification prior to the start of this work shall make the Contractor liable for any and all repairs and/or corrections necessary for proper functioning and coverage of the system without any additional cost to the Owner.

B. The Contractor shall examine carefully the site of work contemplated and the proposal, plans, specifications, and all other contract documents. By submitting a bid, the Contractor attests that he has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and quantity of work to be performed and materials to be furnished, and the requirements of the specifications. The Contractor shall take necessary precautions to protect existing site conditions that are to remain. Should damage be incurred, the Contractor shall make the necessary repair or replacement to bring it back to its original condition at his own expense.

C. Prior to cutting into the soil, the Contractor shall coordinate with the Owner to locate all cables, conduits, sewers, septic tanks, and other such underground utilities as are commonly encountered and he shall take proper precaution not to damage or disturb such improvements. If a conflict exists between such obstacles, notify the Owner who will consider realignment of the proposed work. The Contractor will proceed in the same manner if a rock layer or any other condition encountered underground makes change advisable. Should utilities not shown on the plans be found during excavations, Contractor shall promptly notify the Owner for instructions as to further action. Failure

to do so will make Contractor liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities not shown in plans.

D. The Contractor shall verify the correctness of all finish grades within the work area in order to ensure the proper soil coverage (as specified) of the sprinkler system pipes. The Contractor shall verify and be familiar with location and size of the proposed water supply (P.O.C.). He shall make approved type connection and install new work.

E. The Contractor shall be responsible for notifying the Owner prior to installation that equipment or methods indicated on the drawings or in the specifications conflict with local codes, are incompatible or an error is apparent. It the event the Contractor neglects to do this, he will accept full responsibility for any revisions necessary.

1.8 PERMITS

A. The Contractor shall obtain and pay required fees to any governmental or public agency. Any permits for the installation or construction of any of the work included under this contract, which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the Contractor, each at the proper time. He shall also arrange for and pay all costs in connection with any inspections and examination required by these authorities.

1.9 TESTING

A. General: Unless otherwise directed, tests shall be witnessed by the Owner. Work to be concealed shall not be covered until prescribed tests are made. Should any work be covered before such tests, the Contractor shall, at his expense, uncover, test and repair his work and that of other contractors to original conditions. Leaks and defects shown by tests shall be repaired and entire work re-tested. Tests may be made in sections, however, all connections between sections previously tested and new section must be included in the test.

B. Main Line Piping: Hydrostatically test main line pipe segments after a minimum of twenty-four (24) hours after any solvent connections. Purge any free air in the test pipe sections. Partially backfill pipe but keep all joints exposed. Maintain 125 psi water pressure in new main line piping for a minimum duration of two (2) hours. There can be a maximum +/- 5psi change in pressure during the test.

C. After being installed at the project site, any newly installed Backflow Prevention unit must be tested and approved as functioning properly per the local water agency requirements. Approval of the backflow prevention unit must precede any final inspection of the irrigation system. All costs for testing shall be the responsibility of the Contractor.

1.10 OBSERVATION

A. General:

1. Installation and operations must be approved by the Owner.
2. In no event shall the Contractor cover up or otherwise remove from view any work under this contract without prior approval of the Owner. Any work covered prior to inspection shall be opened to view by the Contractor at his expense.
3. In all cases, where inspection/observation of the irrigation system work is required and/or where portions of the work are specified to be performed under the direction and/or review of the Owner, including but not limited to the review items in the Irrigation plan Observation Log, the Contractor shall notify the Owner at least 72 hours in advance of the time when such review and/or direction is required. Any necessary re-excavation or alterations to the

system needed because of failure of the Contractor to provide the required notification and/or to obtain the review/observation, shall be performed at the Contractor's own expense.

B. Periodic observations shall be required for basic operations and installations during progression of the project. The Owner, or Project Inspector shall perform the observations and shall record the observation on the Irrigation System Observation Log form on the As Built Record Drawings. Such observations will include but not necessarily be limited to the following items as included in the scope of work:
   1. Layout and flagging of sprinkler heads.
   2. Trenching.
   3. Main line installation.
   4. Main line sustained pressure check.
   5. Wire placement.
   6. Partial fill compaction of trenches.
   7. Control valve installation.
   8. Drip line installation prior to backfilling.
   9. Irrigation controller installation and operation.
   10. Backflow Prevention Assembly installation.
   11. Booster Pump installation and start-up.
   12. Sprinkler/emitter coverage prior to the start of planting operations.
   13. Overall system operation and primary/secondary communication.

C. Coverage & Operations Review:
   1. When the irrigation system is operational and prior to soil conditioning operations, the Contractor in the presence of the Owner shall perform a coverage test of the irrigation system. The Contractor shall furnish all materials and labor required to perform the coverage test and to correct any minor inadequacies of coverage disclosed. The Contractor shall inform the Owner and Owner of any deviation from the plan required due to wind, planting, soil, or site conditions that bear on proper coverage. If such notification of necessary corrections or additions to the irrigation system is not provided prior to or during the coverage test, the Contractor shall make all subsequent adjustments and corrections needed for proper coverage without any extra cost to the Owner.
   2. Prior to the start of the maintenance period, the irrigation system shall be reviewed by the Owner for proper operations, and a review of and training on equipment and associated controls performed. Any corrections and/or adjustment shall be made as a condition for the start of the maintenance period and subsequent Final Acceptance.
   3. Submit a Pump Start-up and Training Report after start-up. Include a copy in the O&M manual.

D. Final Acceptance: The work will be accepted in writing when the entire project improvements have been completed to the satisfaction of the Owner. In judging the work, no allowance for deviation from the original plans and specifications will be made unless already approved in writing at proper time. Should it become necessary for the Owner to occupy any portion of the work area before the contract is fully completed, such occupancy shall not constitute acceptance. The Contractor will not be responsible for any damage caused by the Owner's separate work forces.

1.11 REJECTION OF NON-CONFORMING MATERIAL OR WORK

A. The Owner reserves the right to reject any material or work which does not conform to the contract documents. The rejected material or work shall be removed or corrected by the Contractor at no additional cost to the Owner.

1.12 OPERATIONS AND MAINTENANCE INSTRUCTIONS & RECORD DOCUMENTS

A. The Contractor shall prepare and deliver to the Owner's Representative within ten (10) calendar days prior to completion of the maintenance period, all required and necessary descriptive material in complete detail and sufficient quantity, properly prepared in two individually bound sets of Operating and Maintenance Manuals. These manuals shall describe the material installed and shall be in sufficient depth to permit operating personnel to understand, operate and maintain all equipment. Spare part lists and related manufacturer identification shall be included for each installed equipment item. Each complete, bound manual shall contain the following information:
   1. Cover sheet stating Contractor's address and telephone number, duration of guarantee period, and a list of equipment, with names and addresses of local manufacturer representatives and warranty periods.
   2. The Contractor to issue a "CERTIFICATE OF CONSTRUCTION COMPLIANCE" which indicates that all work done, materials and equipment used and installed are in compliance with the approved plans, specifications and all authorized revisions and that the system functions properly.
   3. Complete operating and maintenance instructions and warranties on all major equipment.
   4. Complete set of manufacturer's literature and specifications of material installed, including parts list.
   5. A list of the controller station number for each control valve if different than the control valve number shown on the drawings.
   6. Initial electrical data on each control valve:
      a. Ohms reading for each valve taken at the controller (circuit is OFF).
      b. Voltage reading for each valve taken both at the controller and at the valve (circuit is ON).
   7. A booster pump assembly start-up report by the pump assembly manufacturer's representative. The start-up report shall at minimum include:
      a. A list of attendees to the start-up procedure and training session.
      b. Record of pump parameters and settings.
      c. Notes regarding any incomplete or non-compliant installation, equipment, communication or other work items related to the integration of the pump assembly into the overall irrigation system.
      d. A schedule of recommended maintenance activities.
      e. Customer service contact information for maintenance checks and warranty repairs.

B. The contractor shall furnish one set of As-Built full-scale drawings on bond, and two compact disks with complete sets of digital PDF files of all close-out documents after the As-Built Record Drawings have been reviewed and accepted by the Landscape Architect.
   1. Label first page of each document, or set of documents, "AS-BUILT PROJECT RECORD" in neat large printed letters on lower right hand corner. Record information concurrently with construction progress. Prints for this purpose may be obtained from the Owner. This set of drawings shall be kept on the site and shall be used only as a record set. Do not conceal any work until required information is recorded. These drawings shall also serve as work in progress sheets, and the Contractor shall make **neat and legible** annotations thereon daily as the work progresses, showing the work as actually installed. These drawings shall be available at all times for inspection and shall be kept in a location designated by the Owner.
   2. Drawings: Legibly mark to record actual construction:
      a. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Give sufficient horizontal and vertical dimensions to accurately trace route and depth of each concealed line or item. Accurately locate each capped, plugged or stubbed line.
      b. Field changes of dimension and detail.
      c. Changes made by Field Order, Addenda, or other change document.
      d. Show the final controller station number for each control valve if different than the control valve number shown on the drawings.

3. Deliver all Close-out Documents (As-Builts) to the Owner. Accompany submittal with transmittal letter in duplicate, containing:
   a. Date.
   b. Project title.
   c. Contractor's name and address.
   d. Title and number of each Record Document (As-Built).
   e. Signature of Contractor or his authorized representative.

C. The Contractor shall provide controller chart(s) as follows:
   1. The Contractor shall provide two controller charts for each controller's area of work.
   2. The chart shall show the area of work controlled by the automatic controller and shall be the maximum size that the controller door will allow.
   3. Show the controller station number for each control valve if different than the control valve number shown on the drawings.
   4. The chart may be a reduced drawing of the actual as-built system. However, in the event the valve numbering is not legible when the drawing is reduced, it shall be enlarged to a size that will be readable when reduced.
   5. The chart shall be colored with a different permanent color for each station.
   6. The chart shall be enclosed in a waterproof envelope or laminated.

D. Per MWELO Section 492.9, upon completion of the landscape planting and irrigation system, and as a condition of Final Acceptance and/or the issuance of a Certificate of Occupancy, the licensed landscape contractor shall submit to the approving agency and/or Owner, the following items in a form acceptable to the approving agency and/or Owner:
   1. Project information and contact information for the Owner and Applicant (Contractor).
   2. Certification that the installation complies with the approved Landscape Documentation Package.
   3. Irrigation scheduling parameters used in programming the controller during the establishment and maintenance periods.
   4. A Schedule of Irrigation System Maintenance.
   5. A Landscape Irrigation Audit Report per MWELO Section 492.12. Provide the Audit Report unless the report is not required by the approving agency or Owner.

## 1.13 SPARE PARTS AND EQUIPMENT

A. Prior to the conclusion of the maintenance period, furnish the Owner with the following spare parts and equipment:
   1. One quick coupler key with attached hose swivel for each set of four quick coupler valves installed.
   2. Ten spare nozzles for each different sprinkler head arc and/or radius nozzle installed.
   3. One valve key for the 2" operating nut and/or hand wheel isolation valve.
   4. One hundred feet of in-line emitter tubing with ten straight and ten ninety degree compression fittings.
   5. One functional Universal controller remote programmed to operate the system controllers.

## 1.14 WORK AREA AND SAFETY

A. The Contractor shall furnish, erect, and maintain all temporary facilities; perform all temporary work during the period of construction, including those herein specified. All facilities shall be maintained in proper and safe operating and sanitary conditions at all times

B. The Contractor shall comply with the provisions of the Construction Safety Orders, and General Safety Orders issued by the State Division of Industrial Safety, as well as all other applicable laws, ordinances and regulations.

C. The project site shall be maintained in a neat and safe condition at all times. Cleanup shall be accomplished as the work progresses and upon completion of the work. The Contractor shall provide adequate safety measures to protect workers and the public from injury.

1.15 GUARANTEE

A. Irrigation system consisting of materials, equipment and workmanship shall be guaranteed for proper operation a minimum of one year from date of Final Acceptance of the Work or the Notice of Substantial Completion of the Project, whichever is later. Manufacturer's warranty periods may be longer, and shall be noted in the close-out documents.

B. The Contractor shall be held responsible for repair and/or replacement of damages to new or existing improvements resulting from the defects of materials, equipment or workmanship one year from the date of Final Acceptance of the Work or the Notice of Substantial Completion of the Project, whichever is later.

C. The Owner reserves the right to make temporary repairs as necessary to keep the irrigation system equipment in operating condition. The exercise of this right by the Owner shall not relieve the Contractor of his responsibilities under the terms of the Guarantee as herein specified.

D. The Booster Pump Assembly shall have a minimum 3-year warranty with no-cost annual service checks over the Warranty Period. See the Booster Pump Assembly and Controls sections for additional requirements.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Schedule rated white rigid PVC Pipe shall be made from NSF approved Type 1, Grade I, PVC compound conforming to ASTM D-1785.

B. Class rated (Standard Dimension Ratio) white rigid PVC Pipe shall be made from NSF approved Type 1, Grade I, PVC compound conforming to ASTM D-1784.

C. PVC pipe shall be of the Class or Schedule as follows:
   1. PVC pipe shall meet ASTM D-2241 for solvent weld, plain end, ASTM D-2672 for solvent weld, bell end, and ASTM D-3139 for gasketed bell end. Pipe shall be of the Schedule and/or Class as indicated herein.
   2. Pipe sleeves under paving shall be PVC Schedule 40 for 3-inch and smaller or SDR 35 for 4-inch and larger pipes.
   3. Riser and/or manifold pipe connecting valves to main line fittings shall be Schedule 80 PVC.
   4. Pressurized main line pipe shall be Schedule 40, belled end with solvent welds for pipe sizes less than 2 inches. Pipe sized 2 inches and greater shall be Class 200, SDR 21, with gasketed bell ends.
   5. Non-pressurized lateral line pipe shall be Schedule 40, belled end with solvent welds.

D. All pipes shall be continuously and permanently marked and conform with the following information: manufacturer's name or trademark, nominal pipe size, Schedule or Class of pipe, pressure rating in PSI, ASTM designation and (NSF) seal of approval.

E. Rigid polyvinyl chloride (PVC) Fittings:
   1. White Schedule 40 type I and II grade 1, solvent weld socket fittings ASTM D-2466 for all lateral lines 2-1/2 inches and smaller.
   2. Gray Schedule 80 type I and II grade 1 solvent weld socket fittings ASTM D-2464 for all main line less than 2 inches diameter, and lateral lines 3 inches and larger.
   3. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable (IPS) schedule, and (NSF) seal of approval.
   4. All plastic fittings and connectors shall be injection molded of an improved polyvinyl chloride compound featuring high tensile strength, high chemical resistance and high impact strength in terms of current ASTM standards for such fittings. Where threads are required in plastic fittings, these shall be injection molded also.

F. PVC Solvent Weld Adhesive: All socket and bell type connections shall be joined with primer and PVC solvent cement which shall meet the requirements of ASTM F656 for primer and ASTM D2564, "Standard Specification for Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings." Solvent cement joints for plastic pipe and fittings will be made as prescribed by manufacturer. The high chemical resistance of the pipe and fitting compounds specified in the foregoing sections makes it mandatory that an aggressive colored primer, which is a true solvent for PVC be used in conjunction with a solvent cement designed for the fit of pipe and fittings specified. A heavy bodied, medium set solvent cement, e.g. Weld-On 711 gray, shall be used for all classes and schedules of pipe and fittings.

G. PVC Pipe Thread Sealant: A non-hardening all purpose sealant and lubricant similar to Permatex #51 or Lasco blue pipe thread sealant which is certified by the manufacturer to be harmless to PVC pipe and fittings. Apply sealant to clean male threads, brushing into grooves and to the first three threads of the female threads. A good quality grade of teflon tape recommended by the manufacturer for use with plastics may be used in lieu of sealant. Minimum width of tape to be used is 3/4". A minimum of two wraps and a maximum of three wraps shall be used.

H. PVC Swing Joints: Connections to sprinkler heads from lateral lines shall be made with swing joints as detailed. Pre-assembled swing joints from Hunter, King Brothers or Spears are acceptable.
   1. Use 6” length nipples for 1/2 inch inlet heads.
   2. Use 12” length nipples for 3/4 or 1 inch inlet heads.

I. Coated Ductile Iron pipe and fittings:
   1. Ductile Iron pipe shall be centrifugally cast pipe conforming to ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51, thickness Class 50, with cement - mortar lining and seal coating per ANSI/AWWA C104/A21.4.
   2. Ductile Iron flanged pipe shall conform to ANSI/AWWA C115/21.15.
   3. Ductile Iron flanged fitting to PVC pipe shall use a ‘Megalug’ mechanical joint restraint Series 2000PV by EBAA Iron per either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53, or equal.
   4. Joints shall comply with the following standards:
      a. Rubber gasketed/mechanical joints: ANSI/AWWA C111/A21.11.
      b. Flanged joints: ANSI/AWWA C110/A21.10, B16.1, B16.2.

J. Coated ductile iron push-on fittings meeting ANSI/AWWA C110 or C153/A21.10 shall be used for:
   1. Main line connections for pipe 2 inches and greater in diameter.
   2. New main line service tee at valve connections where a service saddle is not acceptable.
   3. Self-restrainted fittings or joint restraints (Leemco LH or equal) shall be used for all elbows, tees, bends, etc fittings.

K. Coated ductile iron service saddles with stainless steel double straps, Smith-Blair 317, Romac Industries 202NS, or equal, shall be used for remote control/quick coupler valve service connections

on main lines 1.25 inch or greater, and where the available outlet size can match the largest lateral line size downstream of the remote control valve.

L. Galvanized pipe and fittings:
1. Galvanized Pipe shall be hot dip galvanized continuous welded, seamless steel SCH 40 pipe conforming to current ASTM A53 standards.
2. Galvanized Fittings shall be galvanized, threaded malleable iron SCH 40 conforming to current ASTM A865 standards.

## 2.2 BACKFLOW PREVENTION ASSEMBLY

A. Backflow prevention assembly shall be a reduced pressure principle type with resilient seated shut off valves as shown on the Drawings. The backflow preventer shall be approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research.

B. Provide a commercial anti-freeze insulated blanket around the backflow assembly, FrostGuard by BPDI or equivalent. Wrap with minimum half-laps all above grade pipe with insulated tape rated for exterior use.

## 2.3 VALVES

A. Electric Control Valves:
1. Globe valves operated by low-power solenoid, normally closed, manual flow adjustment. Sizes and types as shown on drawings.
2. Provide a pressure regulating module on all control valves, or other pressure regulating components as part of the operating spray head or low volume head zones when the dynamic system pressure is, or may be greater than 45 psi.

B. Electric Master Valves:
1. Master valve shall be the brand and model as noted on the Drawings.

C. Control Valve Marking: Christy's valve identification tag (or equal), yellow color (purple color for recycled water) with text designating controller and valve station number, e.g. "A12", or equivalent.

D. Isolation Valves:
1. Cast bronze, coated ductile iron or coated cast iron gate valve with resilient wedge, non-rising stem and 2-inch operating nut for main line 2-inch size or greater. Match size of mainline.
2. Cast bronze threaded gate valve with bronze cross handle for main line less than 2-inch size.

E. Quick Coupling Valve: Two-piece quick coupling valve as shown on the Drawings.

## 2.4 VALVE BOXES

A. Control Valve/Master Valve/Flow Sensor boxes:
1. Shrub/Ground Cover areas: Carson 1419 body with lockable tan plastic cover, or equivalent. Drip Valve Kits shall use a Jumbo body with lockable tan plastic cover.
2. Turfgrass areas: Carson 1419 body with lockable green plastic cover, or equivalent.
3. Hardscape areas: Christy B16 concrete box (11.75" x 22.25") with N16R composite solid flush lid, or equivalent.

B. Quick Coupler Valve boxes:
1. Turfgrass area: Carson 910 body with lockable green plastic cover, or equivalent.

C. Isolation Valve boxes:
   1. Gate Valve box in hardscape: Christy G05 round concrete valve box (10.375" ID) with cast iron G05C lid, or equivalent.
   2. Gate Valve box in planting areas: Christy F08 round concrete valve box (8" ID) with F08R concrete lid, or equivalent. Use F14 ADS adapter and extension for sizes 2.5 inches and larger.
   3. Ball Valve box: Same as 2.04, A.

D. Control Valve box marking: Plastic lids shall have branded markings, and concrete lids shall have painted markings on the top of lid with minimum 2 inch high stenciled letters showing controller letter and station number.

2.5 CONTROLLER

A. Solid state microcomputer controller, completely automatic in operation, which shall electrically start the sprinkler cycle and program and time the individual stations. Controller shall have attached instruction booklet, integral 24V transformer, clock indicating time of day and day of week, 24V master valve circuit and terminal connection strip. Controller shall be universal remote ready with pre-installed receiver. See Drawings for manufacturer and model.

B. Upgrade components, sensors, flow meters and other accessories shall be a model type compatible with the controller and as specified on the Drawings. Controller assembly shall include boards and/or connections for sensor inputs. Weather sensors shall be located over a planting area.

C. Grounding materials shall conform to ASIC Guideline 100-2002 and manufacturer's specifications.

2.6 UNIVERSAL HANDHELD REMOTE

A. Remote unit shall be able to have complete control over any solid state or electro/mechanical controllers. Unit shall have a minimum range of one mile from transmitter to the receiver.

B. Remote unit shall be capable of coded FM transmissions which eliminate unwanted interference and works amid buildings or hilly terrain.

C. Receiver board shall be integral to the controller unit. The receiver antenna shall be integrated into the controller enclosure.

2.7 CONTROL AND TRACER WIRE, COMMUNICATION CABLE

A. Connections between the automatic controllers and the electric control valves, and tracer wire shall be made with direct burial AWG – UF 600 volt copper wire manufactured for irrigation system use.

B. Hot control wires for the first controller shall be red. If multiple controllers are installed, the hot wire color shall be orange, yellow, purple in order for each controller. Common ground wire shall be white, with a color stripe corresponding to the hot control wire color when multiple controllers are installed. Spare control wires shall be black and spare common wire blue. Tracer wire shall be green.

C. Install in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than #14. Common wire shall be a minimum #12 size.

D. All control wire splices/caps shall be made with direct bury rated, waterproof wire connectors with silicone sealant, Spears DS-500 Dri-Splice, 3M DBR/DBY or approved equal. Use one splice per connector sealing pack.

E. Apply waterproof numbered wire markers or sleeves at both sides of all splices and at the controller terminal board corresponding to the controller (A, B, etc.) and station number (02, 14, etc.). If multiple valves are connected to one station, add a single digit identifier (1, 2, etc.) to the station number (XX), e.g. A02-1, A02-2, etc.

F. Communication/flow sensor cable shall be a shielded and jacketed, minimum 16 gauge twisted pair with drain wire, Paige P7162D or equal compliant with the controller manufacturer's specifications.

G. Below-grade conduit for control wires and/or cables shall be PVC for electrical use with long radius sweeps at direction changes and at valve/splice/pull box terminations.

2.8 IRRIGATION HEADS

A. Spray/Bubbler Pop-up Head: Molded plastic body with pop-up plastic riser and nozzle. Manufacturer's model numbers are listed with description on the Drawings.

B. Rotor Pop-up Head: Molded plastic body with plastic riser and nozzle. Gear driven rotation with memory arc, balanced nozzle sets. Manufacturer's model numbers are listed with description on the Drawings.

2.9 BOOSTER PUMP ASSEMBLY AND CONTROLS

A. Pump shall be a variable frequency drive (VFD) type and shall provide high efficiency and stable operating pressure (flat curve and low relative shut-off head should not exceed normal operation TDH by more than 30%) at the prescribed flows.

B. Electrical power supply shall be 240 AC volts, 60Hz, triple phase. Provide an electrical service disconnect with fuses of appropriate amperage as part of the control panel.

C. Welded or grooved steel or brazed/soldered copper tubing piping systems shall be provided. Threaded connections are allowed only at the interface of threaded mechanical appurtenances.

D. All above-grade piping shall be sized to maintain velocities below seven-and-a-half feet (7.5') per second.

E. Valves shall be 200 PSI rated, epoxy coated ductile iron resilient wedge gate valves, conforming to WWA C509 Standards.

F. Bypass piping and valves shall be included in order to isolate the pump while providing non-boosted flow. Bypass check valve shall be flanged or wafer-style silent check valve in order to minimize water hammer during pump cycling.

G. Inlet and discharge pressure gauges shall be two inches (2") stainless chased, glass faced, liquid filled and installed with gauge cocks (range to be minimum of 50% greater than normal operating pressure).

H. The VFD pump control panel shall be UL certified. The panel shall have a manual disconnect switch. The controls shall have digital readouts with a color touch screen, minimum 320 x 240 pixel backlit operator interface, and be housed in a minimum NEMA 3R weatherproof enclosure. The unit shall have an across-the-line type magnetic starter and overload protection. Minimum control provisions shall incorporate programmable logic control (PLC) such as phase failure (low and high voltage) protection, time-delayed start, low supply low pressure and low/no flow safety control circuits.

Control program shall enable variable pressure and/or flow set points for both pump activation and/or discharge pressure. The VFD unit shall be activated by:

1. The controller's pump start feature (station or program based) through the installation of a 24-volt AC pump start relay of sufficient amperage rating for the system.

I. Integrate the VFD control panel into the pump assembly structure. Where the existing space available for access to the pump control panel is problematic, the pump control panel may be surface mounted adjacent to the booster pump assembly where space and structure permits with the approval of the Owner.

J. The pump assembly shall be an integrated unit on a steel support structure with a powder coated enclosure.

K. Other features of the pump assembly shall include:
   1. A color touch screen for pump operation control options
   2. Pressure relief valve
   3. Air relief valve on high point of interior piping
   4. Exterior alarm light for flow or pressure loss alerts
   5. Pressure gauges on both intake and discharge piping.
   6. Offsite system monitoring, control adjustments and troubleshooting by means of a built-in cellular modem.
   7. A three year warranty for labor and parts from the start-up date.
   8. Three annual system operation reviews and status report to the Owner during the warranty period.

L. The booster pump assembly (BP) shall be furnished by the Owner and installed by the Contractor. The BP manufacturer shall be:
   1. Precision Pumping Systems, Boise, ID. 208-323-5300; Rob Aldinger.

## 2.10 CONCRETE

A. Cast-in-place Portland cement concrete used for pipe encasement, cover, thrust blocks, pipe support or other below-grade use shall at minimum comply with 2,800 psi 28 day strength.

## 2.11 OTHER MATERIALS

A. Materials not specifically indicated but necessary for the proper execution of this work shall be of first quality as selected by the Contractor subject to the acceptance of the Owner.

B. All materials appearing in the legend and details of the irrigation drawings are to be furnished and installed by the Contractor unless specifically noted to the contrary. Contractor is responsible for installation according to plans and details. The system shall efficiently and uniformly irrigate all areas and perform as required by these plans and specifications.

C. Granular bedding material shall be clean natural occurring sand, free from clay, salt, sea shells or organic material, suitable for the purpose intended, and shall be of such size that 90 percent to 100 percent will pass a No. 4 sieve and not more than 5 percent will pass a No. 200 sieve.

PART 3 - EXECUTION

3.1 SYSTEM DESIGN AND VERIFICATION

A. Contractor shall verify existing pressure and any existing irrigation equipment, and shall inform the Owner of any discrepancies between the exsiting systems' make and model of equipment, such as sprinkler heads, control valves, etc., and those indicated in the Drawings in writing prior to the start of irrigation system installation. Failure to inform the Owner of any discrepancy within seven working days prior to beginning of system installation will place the responsibility of any and all corrective action on the Contractor at no expense to the Owner.

3.2 PIPING INSTALLATION

A. General:
1. Any equipment installed by the Contractor and deemed to be for the use of the Owner in various situations (i.e., control valves, control panels, etc.) shall be so installed to be readily accessible and quickly operable. Equipment deemed by the Owner to be inoperable for its intended purpose shall be reinstalled by the Contractor in an operable position before approval will be given. Any changes made by the Contractor shall be done without any additional cost to the Owner.
2. The Contractor shall be responsible for layout of proposed facilities and any minor adjustments required due to differences between existing conditions and the Drawings. Any such deviations in layout shall be within the intent of the original drawings, and without additional costs to the Owner. The Owner will indicate the proposed precise location of the control panels. Head spacing on drawings is diagrammatic. Head spacing and patterns shall be adjusted to provide complete and adequate coverage with a minimum spray on non-planted areas. Where head spacing is not specifically noted, Contractor shall install sprinkler heads evenly along the irrigation area's perimeter. Flush all lines prior to installation of heads.
3. Support piping without strain on joints or fittings and allow for piping expansion and contraction. "Snake" pipe into trench in accordance to manufacturer's recommendations to allow for expansion. Lay on solid bedding, at uniform depth.

B. The Contractor shall examine all other portions of working drawings and plan trenching and pipe layout so that no conflict will arise between irrigation and any other work. Any corrective action will be the Contractors responsibility at no further expense to the Owner.

C. Excavations:
1. Excavations shall be open vertical construction, sufficiently wide to provide clear working space around the work installed and to provide ample space for backfilling and tamping.
2. The use of a vibratory plow or methods other than open vertical trenching will not be allowed without the written approval of the Owner. To obtain such approval, a field test must be performed, at the proposed site, with the equipment to be used in the presence of the Owner and Owner. The field test is to indicate if the proposed site is favorable to the plowing method. Approval for plowing at one location does not allow the use of plowing at another location. Approval for plowing must be obtained for each location where the use of plowing is proposed. If, at previously approved plowing locations, conditions for plowing become unfavorable as determined by the Owner, plowing shall be terminated.
3. Trenches for pipe and equipment shall be cut to required grade lines, and compacted to provide an accurate grade and uniform bearing for the full length of the line.
4. Unless written approval for using native soils as bedding material is given by the Owner, main line pipe shall be placed on a minimum 6 inch depth of granular bedding material.
5. Excess trench soil with rocks greater than ½ inch diameter shall be removed from the planted area and spread as directed by the Owner.

6. When two pipes/conduit are to be placed in the same trench, it is required to maintain a minimum six inch (6”) horizontal separation between pipes/conduit.
7. Depth of trenches shall be sufficient to provide a minimum cover above the top of the pipe as follows:
    a. 24-inch minimum over main lines and wire conduit.
    b. 18-inch minimum over non-pressure (rotary pop-up) lateral lines.
    c. 12-inch minimum over non-pressure (pop-up spray head) lateral lines.
    d. 24-inch minimum from subgrade over any lines located in a paved vehicle area.
    e. Maximum cover above the top of the pipe shall not exceed twelve inches (12”) greater than the required minimum cover.
    f. 12-inch minimum cover over drip line non-pressure lateral and manifold pipe, and main distribution tubing.
8. Maximum cover above the top of the pipe shall not exceed twelve inches (12") greater than the required minimum cover, unless specifically noted on the drawings.

D. Assemblies:
1. Routing of pressure supply lines as indicated on drawings is diagrammatic. Install lines (and various assemblies) in such a manner as to conform with details on plans.
2. Install all assemblies specified herein according to the respective detail drawings or specifications pertaining to specific items required to complete the work. Perform work according to best standard practice.
3. Install no multiple assemblies on plastic lines. Provide each assembly with its own outlet.
4. All threaded pipe and fittings shall be assembled using an approved teflon tape, or equivalent, applied to the male threads only. A minimum of two (2) wraps and a maximum of three (3) wraps of an approved teflon tape will be required.
5. No main line elbows, branch tees or isolation valves are to be located closer than five (5) feet to each other without prior approval of the Owner.

E. Line Clearance: All lines shall have a minimum clearance of four inches (4") from each other, and six inches (6") from lines of other trades. Parallel lines shall not be installed directly over one another.

F. Plastic to Steel Connections:
1. At all plastic (PVC) pipe connections, the Contractor shall work the steel connections first. Connections shall always be plastic into steel, never steel into plastic. An approved teflon tape shall be used on all threaded (PVC) to steel, never steel into plastic. An approved teflon tape shall be used on all thread (PVC) to steel pipe joints applied to the male threads only, and light wrench pressure is to be applied. A minimum of two (2) wraps and a maximum of three (3) wraps of an approved 3/4" wide teflon tape will be required.
2. A non-hardening sealant and lubricant similar to Permatex #51 or LASCO blue pipe sealant may be used in lieu of teflon tape. Apply sealant to clean male threads brushing into grooves and to the first three threads of the female threads.

G. Plastic Pipe:
1. The Contractor shall exercise care in handling, loading, unloading, and storing plastic pipe and fittings. All plastic pipe and fittings shall be stored under a weatherproof roofed structure before using and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lie flat so as not to be subject to undue bending or concentrated external load at any point.
    a. All lumber, rubbish, rubble, concrete and rocks shall be removed from the trenches by the Contractor. Pipe shall have a firm uniform bearing for the entire length of each pipe line to prevent uneven settlement. Wedging or blocking under riser tees shall be done only if specified on the plans. Pad trenches with soil as necessary to provide uniform bearing surfaces.

b. Where extensive lengths of pipe are installed, snake pipe in trench from side to side to allow for expansion and contraction. One additional foot per one hundred (100) feet of pipe is the minimum allowance for snaking. Never lay pipe when there is water in the trench or when the temperature is 32 degrees F or below.
c. All changes in direction of pipe shall be made with fittings, not by bending. No main line fittings for changes in direction shall be greater than 45 degrees. Provide a minimum five (5) feet between changes in direction fittings.
d. Safely handle primers and cements per ASTM F-402. Make solvent weld joints per ASTM D-2855 with a non-synthetic bristle brush in the following sequence:
    1) Make sure pipe is cut square and all rough edges and burrs are removed. All connecting surfaces are properly cleaned and dry prior to application of pipe primer.
    2) Apply an even coat of colored primer to pipe and fitting prior to application of solvent.
    3) Apply an even coat of solvent to the outside of the pipe, making sure that the coated area is equal to the depth of the fitting socket.
    4) Apply an even light coat of solvent to the inside of the fitting.
    5) Apply a second coat of solvent to the pipe.
    6) Insert the pipe quickly into the fitting and turn pipe approximately one-eighth to one-quarter turn to distribute the solvent and remove air bubbles. Hold the joint for approximately fifteen seconds so the fittings do not push off the pipe.
    7) Using a clean rag, make sure to wipe off all excess solvent to prevent weakening at joint.
    8) Exercise care in going to the next joint so that pipe is not twisted, thereby disturbing the last completed joint.
    9) Allow at least fifteen minutes setup time for each welded joint before moving.
    10) Repairing plastic pipe when damaged shall be done by replacing the damaged portion of pipe.

H. Concrete Thrust Blocks: Concrete anchors or thrust blocks shall be provided on pressure main pipelines 2 inches or greater in diameter at abrupt changes in pipeline grade, changes in horizontal alignment (bends, tees and crosses), reduction in pipe size (reducers, reducing tees or crosses), end-line caps or plugs, and/or in-line isolation valve to absorb any axial thrust of the pipeline. The pipe manufacturer's recommendation for thrust control shall be followed. Thrust blocks must be formed against solid unexcavated earth (undisturbed). Do not enclose entire joint in concrete. Provide a minimum of three cubic feet of concrete for each thrust block.

I. Concrete thrust blocks may be eliminated if the main line piping system uses self-restrained fittings and bell joint restraints per manufacture’s specifications throughout.

## 3.3 PIPE BACKFILL

A. Backfill shall not be placed until the installed system has been inspected, pressure tested and approved by the Owner.

B. Backfill for first 6 inches underneath, and 4 inches around and above main line pipe and control wires shall be granular bedding material, unless the Owner approves in writing that native soil may be used for initial backfill in lieu of granular bedding material. Backfill material for the upper portion of the trench shall be approved soil. Unsuitable martial, such as pipe remnants and wire including clods and rocks over two inches (2") in size, shall be removed from the premises and disposed of legally at no cost to the Owner.

C. Backfilling for all pipe shall be carried out in two basic stages.
    1. Stage One Backfilling: This shall be accomplished as soon as possible after the pipe is laid. A bedding of uniform depth with no voids must be provided along the entire length of the pipe. The bedding material should be placed in the trench and tamped into the areas under the pipe,

using a suitable tool. Joints should be left exposed until hydrostatic tests are completed. Cover only those portions of the pipe necessary to prevent movement or damage.

2. Stage Two Backfilling: This shall be completed after all hydrostatic tests are completed and the piping system has been thoroughly checked for leaks or other defects. Continue to add backfill material in four inch (4") layers and hand tamp to achieve density similar to adjacent soil. After twelve inches (12") in main line trenches and eight inches (8") in lateral line trenches of hand tamped soil is in place over the pipe and fittings, backfilling can be continued, using light machinery to place dirt in the trenches in six inch (6") layers and to compact the dirt to conform to adjacent soil. Extreme care should be taken to avoid damage to the pipe from machinery that is too heavy. All trenches shall then be water jetted to assure uniform settling and compaction. Backfilling operations will not be considered complete until the top surface has been graded to conform to the adjacent soil. All rocks uncovered and not used as backfill must be collected and removed from the site.

D. All backfilling shall be done carefully and shall be properly tamped. All soil shall be tamped and puddled to eliminate any voids.

E. Surplus earth remaining after backfilling shall be disposed of as directed by the Owner.

F. PVC piping and fittings shall not be backfilled during periods of extreme heat or when a sudden lowering of temperature of the pipe may cause separation of joints or fittings.

G. Contractor shall fill with properly amended topsoil any irrigation trench that subsides during the warranty period. Contractor shall assume all cost associated with the trench repair, including but not limited to plant replacement of a size of plant disturbed at the time of the repair.

3.4 BACKFLOW PREVENTION ASSEMBLY

A. Install the backflow prevention assembly per the Contract Documents, manufacturer’s installation instructions, and agency requirements.

B. Install the freeze blanket per the manufacturer’s instructions.

C. Operational testing of any new backflow prevention assembly shall be performed by a Certified testing firm paid by the Contractor. Provide a Certificate of Operation satisfactory to the local agency.

3.5 CONTROL AND TRACER WIRE, AND COMMUNICATION CABLE

A. Install control wires alongside of main line piping. Do not tape wires together when encased in sleeve or conduit. Minimum cover shall be 24 inches. Crimp wires together at valve manifold with Scotchlok connector. Conventional valve wire splices shall use a 3M DBY splice kit. Tag all control wire at splices with approved control wire markers.

B. Wire size shall be determined by the number of valves operating on a given wire and the distance from the controller to the farthest valve, as specified by the charts furnished by the remote-control valve manufacturer. Splices are only allowed when rerouting or repairing existing wire. All splice connections must be provided in a valve box.

C. Communication/sensor cable shall be installed in electrical conduit with long radius sweeps at direction changes and at valve/splice/pull boxes. Maintain a minimum six inch clearance to adjacent pipe. Minimum cover shall be 24 inches.

D. Install tracer wire along the top of pipe at the following locations:
   1. All pipe sleeves.
   2. Main line pipe without adjacent control wire.

3.6 VALVES

A. The Contractor shall make all necessary connections for operation, and shall be connected and aligned to provide the most efficient flow of water to the irrigation heads. Where pressure regulating electric control valves are specified, the Contractor shall adjust the valve so a uniform distribution of water is applied by the heads, and that the most remote heads operate at the pressure recommended by the head manufacturer.

B. Each valve is to be enclosed in a separate valve box. The valve box shall be secured on firm soil clear of valves and wiring connections. Valve boxes and lids shall be set to finished grade or as indicated on the Drawings. Use valve box extensions of the same material as the box to the proper depth below the pipeline. Valve boxes shall be supported by common bricks at each corner and at the long side of the box. Use a minimum of six bricks to support rectangular boxes and four bricks to support round boxes. Backfill carefully and properly compact in order to prevent settlement and subsequent damage.

C. Install a concrete collar around valve boxes when located in asphaltic concrete pavement or in turfgrass areas.

D. When existing valve and/or splice boxes are within the area of work, replace in kind any damaged boxes and/or lids, unless noted otherwise. Adjust the elevation of all existing boxes within the area of work to final grade per the drawings.

E. Locate valve boxes in ground cover/shrub planting areas instead of turfgrass areas whenever possible. Locate valve boxes 18” from and perpendicular to adjacent paving. When grouped together, provide equal spacing of at least 36" between boxes.

F. Permanently attach the plastic valve identification tag to the remote control valve body and locate so it’s clearly visible in an open valve box.

G. Permanently secure the control valve identification label to the top of concrete valve box lids with non-corrosive connectors.

3.7 AUTOMATIC CONTROLS

A. Install the controller and/or associated equipment, enclosure, sensors, and accessories per the manufacturer’s details and installation requirements, and the construction documents.

B. Where the controller is not connected to a building’s electrical grounding system, install a grounding circuit for controller and associated equipment with either a ground rod or ground plate per ASIC Guideline 100-2002.

C. Where the new controllers are a site satellite controller in a central control system, the site satellite controller equipment and installation shall be reviewed for system compliance by an authorized central system distributor/installer.

D. Connect operational control wires or accessory components to the controller, and program valve schedules appropriately for the new planting.

E. The Owner shall review the fully functional operation of the irrigation control system prior to acceptance of the system, and as a requirement for the start of maintenance.

F. Install automatic controller chart in laminated or watertight plastic envelope inside controller cover showing which valves are connected to which stations on controller in the work area.

G. Provide the Owner with one fully charged handheld remote controller unit(s).

3.8 ELECTRICAL SERVICE

A. Electrical service shall be provided to the controller and booster pump location by the electrical subcontractor. The irrigation subcontractor shall make the electrical power connection to the controller and booster pump per code requirements.

B. Install grounding rods, plates, etc. per manufacturer's and CEC code requirements

3.9 SPRINKLER HEAD INSTALLATION

A. Head spacing on drawings is diagrammatic. Head spacing and patterns shall be adjusted to provide complete and adequate coverage with a minimum spray on non-planted areas. Flush all lines prior to installation of heads.

B. Overhead distribution sprinkler heads shall be installed as detailed, set adjacent to the edge of hardscape elements (2 - 4 inches for spray heads, 6 - 8 inches for rotary heads) and perpendicular to the finish grade. Sprinkler spray heads directed toward a building shall be a minimum 7 feet from building walls, and a minimum 2 feet when directed away from the building. Sprinkler heads in turfgrass areas shall have a minimum 10-foot radius except for corners.

C. The top of the nozzle in pop-up bodies shall be flush to the finish grade in areas to receive turfgrass seed/stolons, and in ballfield skinned infields. The top of the nozzle shall be one-half inch (1/2") above the finish subgrade in areas to receive standard cut turfgrass sod.

D. High speed or other sprinkler heads in dust control zones at ballfield skinned infields shall be installed in turfgrass areas where directly adjacent to the skinned infield.

E. Where individual shrub bubblers are installed, each plant shall have a bubbler within 10 - 14 inches of the shrub center.

F. Upon completion of the installation, the Contractor shall adjust or change sprinkler head nozzles to uniformly distribute water without overspray and shall place entire irrigation system in first-class operating condition without any additional cost to the Owner.

G. Sprinkler heads shall be adjusted in order by fully opening the sprinkler furthest from the control valve and working back toward the control valve. Adjust sprinkler heads which spray toward buildings or adjacent hardscape so that water spray does not contact the side of buildings or significantly over-spray onto hardscape.

3.10 BOOSTER PUMP ASSEMBLY AND CONTROLS

A. The contractor shall coordinate with the pump assembly vendor as to the final layout, orientation and configuration of the pump assembly, control panel, inlet and outlet piping, utility piping and electrical/data conduits to accommodate the existing and/or proposed conditions, equipment and improvements. Pump assembly layout shall comply with code required clearances for existing and

proposed equipment. Sawcut, remove and replace in kind any pavement necessary for pipe access, electrical and/or control connections.

B. Make all necessary modifications and/or rerouting of the supply and discharge piping, either above or below grade, to accommodate the final pump assembly location, orientation and piping configuration with a minimum of direction changes.

C. Install pump assembly and controls per the design intent of the Contract Documents, the manufacturer's specifications and as shown on the approved Shop Drawings.

D. A concrete pad shall extend around the entire pump assembly package (all piping and appurtenances) a minimum of 6 inches on all sides. Pad shall be a minimum 8 inches thick with a minimum 6 inches below grade over 6 inches of scarified and compacted soil subgrade. The pad shall have #4 rebar at 24 inches-on-center, both ways. The top of the pad shall be a minimum of 2 inches above the adjacent finish hard surface, or 4 inches above adjacent dirt or DG surface. Secure the pump to the pad with non-corrosive anchor or expansion bolts of the maximum size allowable by the support skid, but at least 0.5 inch diameter.

E. The Contractor shall be responsible for correct procedures in loading, unloading, stacking, transporting, handling, supporting and securing all materials and equipment to be used in the system. The Contractor shall avoid rough handling which could affect the useful life of equipment. Materials and equipment shall be handled in accordance with the manufacturer's recommendation on loading, unloading, and storage.

F. A representative of the pump assembly manufacture shall be responsible for all start-up procedures and certifying that the pump operates within design parameters. Pump manufacturer shall train the contractor and Owner in proper pump operation. A startup report containing voltage and amperage readings, suction and discharge pressure readings, estimated flow conditions, and general operating characteristics shall be submitted to the District within 7 days of a successful certification. Contractor shall make all adjustments as necessary for proper pump and controls operation.

G. The pump vendor shall provide a non-prorated extended warranty for 3 years from the start-up certification. The pump vendor shall guarantee to provide warranty service within three (3) days of a service call request.

H. The pump vendor shall include an annual service check to perform routine maintenance every 12 months from the date of factory start-up, or on Spring seasonal start-up throughout the warranty period without any cost to the Owner.

3.11 CONCRETE

A. Concrete shall be installed in accordance with the relevant portions of the Site Concrete specification section.

3.12 COMPLETION AND MAINTENANCE

A. After the system has been completed but prior to the start of maintenance, the Contractor shall operate the automated system with the Owner, shall instruct the Owner in the operations and maintenance of the system and controls, and shall program the controller for each station.

B. If site satellite controller(s) for a central control system is installed, an authorized central control distributor/installer shall program the central base station to communicate with the site satellite controller(s), and shall verify that proper communication protocols are operational.

C. The irrigation system shall be maintained and adjusted as required to provide proper coverage throughout the maintenance period or until Final Acceptance of the project, whichever is greater. Irrigation system maintenance shall commence upon an acceptable review following the completion of irrigation installation, planting operations and general clean-up.

D. The maintenance period shall not terminate until the close-out documents and as-builts record drawings have been submitted and accepted.

3.13 REPAIR AND CLEAN-UP

A. All areas shall be maintained in a neat and orderly condition at all times. All reasonable precautions shall be taken to avoid damage to new planting and improvements. Disturbed and/or damaged areas shall be restored to their original condition to the satisfaction of the Owner.

B. Where trenching or other work disturbs existing and/or newly planted turfgrass and/or planting, the Contractor shall reinstall the existing sod if viable, or install a full width of new turfgrass sod or new planting to match the existing turfgrass/planting species, variety and size, after first conditioning the top 6 inches of soil per the Landscape Planting specification. Adjust finish grades to account for the new turfgrass sod’s soil mat so that the new sod is flush to the adjacent turfgrass.

C. After the irrigation operations are completed, the Contractor shall remove all trash, excess materials, empty containers or any other debris accumulated by the work from the site. All damage caused by the work shall be repaired or material replaced at the Contractor's expense. The site shall be left in a neat and orderly condition to the satisfaction of the Owner.

END OF SECTION

**SECTION 32 90 00 - LANDSCAPE PLANTING**

## PART 1 - GENERAL

### 1.1 SCOPE OF WORK

A. The Contractor shall furnish all material, labor and equipment necessary to install all landscape work as indicated in the plans and specifications.

B. The landscape work includes but is not necessarily limited to the following:
1. Soil preparation including cross ripping of all planting soil.
2. Weed control including an application of a pre-emergent herbicide.
3. Providing import planting topsoil at raised grade planters and/or at planting areas needing fill.
4. Fine grading, conditioning and amending planting topsoil.
5. Installation of turfgrass sod.
6. Sixty (60) day maintenance.

C. Related Work Specified Elsewhere
1. Contract Drawings, Addenda, general provisions of the Contract, including General and Supplemental Conditions, and Division 1 Sections apply to work of this section.
2. Section 32 01 90 – Existing Landscape Protection
3. Section 32 84 00 - Irrigation System

### 1.2 DEFINITIONS

A. Unless noted otherwise, the term "approved" shall mean by the Owner in writing.

B. Agencies and Organizations:
1. ASTM- American Society for Testing and Materials
2. ANSI – American National Standards Institute
3. ISA – International Society of Arborists
4. SSPWC – Standard Specifications for Public Works Construction, by the American Public Works Assoc./Associated General Contractors of California.
5. TPI – Turfgrass Producers International

C. Owner: The Owner’s authorized representative or authorized consultant.

### 1.3 QUALITY ASSURANCE

A. The work of this Section shall be performed by a single firm experienced in landscape planting and holding a current California Contractor’s A or C27 License.

B. Inspection:
1. All landscape work and materials shall comply with applicable Federal, State, County and City regulations.
2. All plant material shall be reviewed onsite or by providing photo submittals by the Owner’s Representative and/or Landscape Architect prior to positioning and planting. The lack of a review shall not limit the right of rejection during any stage of the work until Final Acceptance for any reason including condition of the foliage or root ball, size, variety, form, appearance, latent defects or injuries or location errors. Rejected or wrongly located plants shall be removed/relocated from/on the site and replaced/replanted immediately by the Contractor as directed at no additional cost to the Owner.

C. Qualifications of Workers
   1. Employ skilled workers who are thoroughly experienced in landscape planting and who are completely familiar with specified requirements and methods needed for proper performance of the work in this section.
   2. Provide adequate supervision by a qualified foreman fluent in English that will be continuously onsite during the performance of this work.
   3. Weed control pesticides shall only be applied by an individual holding a valid Qualified Applicator Certificate (Category A) issued by the Department of Pesticides Regulation. Submit a copy of the Certificate.

D. Any pruning of existing trees specified as part of this Work shall be performed under the direct supervision of an ISA Certified Arborist and in compliance with ANSI A300-Part 1 Standard Practices (Pruning).

1.4 SUBMITTALS

A. In accordance with the Submittal section, submit:
   1. A complete materials list of all items proposed to be furnished including estimated quantities.
   2. Laboratory analyses of soil conditioning materials, e.g. organic compost, shall have been performed within three months of the submittal date.
   3. Quality Certificates and/or Certificates of Inspection required by government agencies (providing duplicate copies for the Owner's Representative).
   4. Qualified Applicator Certificate, and DPR Registration Certificates and Material Safety Data Sheets for all pesticides/herbicides proposed for use.

B. Soil amendments: Submit one (1) pint sample and an analysis of organic compost and mulch.

C. Other Samples: When requested by the Landscape Architect and/or Owner's Representative.

D. Soil Fertility Analysis and Recommendations:
   1. The Contractor shall provide and pay for a fertility analysis of the existing topsoil and any proposed import planting topsoil. After mass grading operations are completed, native soil samples shall be collected for the fertility analysis by collecting a minimum of 5 representative samples of the soil per acre throughout the area of work. Separate samples shall be produced for cut and fill areas, and for any other area composed of soils not similar to the existing soils. Each sample shall be a minimum of one pint each, and shall be thoroughly mixed together to prepare a homogenous sample. A one quart representative sample for cut, fill and any other special conditions shall be submitted to the soil testing laboratory as a representative sample for fertility analysis. The fertility analysis shall at a minimum provide the following data:
      a. soil texture class and percent sands, silts and clays per ASTM D422
      b. estimated soil infiltration and percolation rates
      c. pH
      d. organic matter (%)
      e. total soluble salts (ECe)
      f. Cation Exchange Capacity (CEC) and Percent Cation Saturation for K, Mg, Ca and Na
      g. major and minor nutrients (ppm).
   2. Recommendations for improvement of the soil conditions for optimum plant growth shall be made by the testing laboratory, and at a minimum shall include the following:
      a. A fertilizer and amendment application program (including macro and micro nutrients) for both pre-planting and maintenance fertility applications for broad area tillage and for planting pit backfill (pre-plant only).
      b. Treatments to neutralize soil pH and to correct any adverse conditions as warranted.
      c. Recommendations shall address soil conditioning for turf planting area tillage.

3. The soil analysis and recommendations shall be performed by one of the following laboratories capable of providing the above analyses by a licensed soil scientist:
   a. D&D Agricultural Laboratory. Contact Darrin Peters at 559-348-1818.
   b. Wilber-Ellis Company. Contact Michael Cline at 209-442-1220.
4. The Contractor shall submit the results of the soil testing investigations and shall receive written direction from the Landscape Architect before proceeding with any soil conditioning activities such as fertilizing and/or tillage of amendments.

E. Within seven days from the start of the maintenance period, submit a calendar of maintenance activities, including scheduled dates for mowing, fertilizing, weed control and all other activities. Provide the quantities of maintenance fertilizer and any other materials scheduled to be used in each application during the maintenance period.

F. Submit invoices and/or delivery tags from material suppliers for all amendments, fertilizer, seed, plants, mulch and any other materials provided for the landscape planting installation and applied during the maintenance period. Submit tags from seed packaging indicating seed varieties, percent purity and percent germination minimums. The invoices and/or delivery tags shall be provided directly to the Owner's Representative/Inspector of Record within 24 hours of delivery to the site, as well as to the normal submittal recipients per the Contract Documents.

G. Close-out Documents: Submit prior to the end of the maintenance period. Acceptance of the Close-out documents in a condition for scheduling a Final Acceptance review. Provide two bound copies of the following:
1. Cover sheet stating Contractor's address and telephone number, duration of guarantee period, and a list of plant nurseries, materials and equipment vendors with names and addresses of the vendor/manufacturer representatives and warranty periods.
2. A "CERTIFICATE OF CONSTRUCTION COMPLIANCE" which indicates that all work done, materials and equipment used and installed are in compliance with the approved plans, specifications and all authorized revisions.
3. Maintenance Manuals and Instructions: Submit a monthly schedule of procedures to be established by Owner for maintenance of landscapes (trees, mixed planting and turfgrass) for one full year and shall include recommendations for fertilizing, pest and disease control, weeding, mowing, aeration and top dressing.
4. Soil Amendment and/or Seed/Stolon confirmation form noting the installed quantities of materials, tags or invoices from Subsection F. above, and the person who confirmed the delivery and installation of the materials.
5. Operations and Maintenance Manuals and Warranty certificates for any maintenance equipment turned over to the Owner.
6. As-built Record Drawings with all modifications to the Drawings noted in red ink, and the Landscape Planting Observation Log completed.

1.5 AVAILABILITY

A. The Contractor shall confirm availability of plants, supplies, and materials prior to submitting his landscape bid. Plant variety substitutions are not desired.

1.6 EXISTING CONDITIONS

A. The Contractor is to visit the job site to verify existing conditions including soils, vegetative growth, subsurface conditions, existing grade and drainage, irrigation system etc. making allowances in his bid for any required work to provide the landscape installation as specified in the construction documents.

B. The Contractor shall notify the Owner to locate underground lines prior to hole boring or trenching. Do not permit heavy equipment such as trucks, rollers, or tractors to damage utilities. Hand excavate as required to minimize possibility of damage to underground utilities. Maintain grade stakes set by

others until removal is mutually agreed upon by all parties concerned. Prevent damage to temporary risers of underground irrigation system and similar obstructing work located in the landscape areas.

C. If there is a conflict with existing utilities, improvements and/or planting and the proposed planting, Contractor shall promptly notify the Owner's Representative for instructions as to further action. Failure to do so will make Contractor liable for any and all damage or corrective actions arising from his operations.

D. Prior to the start of this work, the Contractor and the Owner's Representative shall verify the operational condition of that portion of the existing irrigation system pertaining to the proposed planting area. The Contractor shall notify the Owner's Representative of any repairs and/or corrections necessary for proper functioning and coverage. The repairs and/or corrections shall be completed before any plant material is planted. Failure to perform system verification and provide notification prior to the start of this work will make the Contractor liable for any and all repairs and/or corrections necessary for proper functioning and coverage, as well as any required plant replacement, without any additional cost to the Owner.

E. No plants shall be planted in situations that show poor drainage infiltration or low areas that result in standing water. Such situations shall be corrected by the Contractor as directed by the Landscape Architect or Civil Engineer. Failure by the Contractor to notify the Owner of poor drainage conditions prior to proceeding with the conditioning or planting operations shall place the responsibility for any plant removals, additional soil conditioning and replanting on the Contractor without any additional cost to the Owner. Any corrections of finish grading not in compliance with the Contract Documents including plant removal, soil conditioning and replanting shall be performed by the Contractor at no additional cost to the Owner.

1.7 PROTECTION

A. The Contractor shall guarantee repair of damage to any part of the premises resulting from but not limited to leaks, defects in materials or workmanship, operation of equipment, storage of materials and/or equipment, installation of underground or overhead utilities. The Contractor shall be liable for any and all accidents resulting from his work, including open holes and trenches during construction.

B. Protect new and existing landscape areas in the area of work from theft, loss, damage and deterioration during storage, installation and maintenance. Protect from unauthorized persons (trespassers) as well as from operations by other contractors and tradesmen, and landscape operations. Protect all planted turf and shrub areas from persons as well as operations of other contractors and the Owner. Cost of protection shall be born by the Contractor with means of protection such as temporary fencing as approved by Owner. Cost for protection shall be included in the Contractor's bid for the work.

C. Contractor shall repair or replace damaged work and/or damage to existing improvements/landscape as identified by the Owner's Representative to a condition acceptable to the Owner's Representative. No additional payment will be made to the Contractor for repair or replacement of damaged work and/or damage to existing improvements/landscape.

1.8 OBSERVATIONS

A. General:
1. Installation and operations must be approved by the Owner.
2. In no event shall the Contractor cover up or otherwise remove from view any work under this contract without prior approval of the Owner. Any work covered prior to inspection shall be opened to view by the Contractor at his expense.
3. In all cases, where inspection of the landscape planting work is required and/or where portions of the work are specified to be performed under the direction and/or review of the Owner, the Contractor shall notify the Owner at least 72 hours in advance of the time when such inspection

and/or direction is required. Any necessary re-excavation or alterations to the planting needed because of failure of the Contractor to have the required inspection, shall be performed at the Contractor's own expense.

B. The Owner or the Project Inspector shall perform periodic observations and shall record the observation on the Landscape Planting Observation Log form on the As Built Record Drawings. Field Reports by the Owner's Representative noting the observations may be acceptable if included in the Close-out Documents. Such observations shall include but are not necessarily be limited to:
   1. Weed control operations prior to other portions of work.
   2. Ripping and soil conditioning of the planting area.
   3. Condition and quality of plant material prior to planting.
   4. Planting of turfgrass.

C. Any corrective action called for shall be immediately performed by the Contractor.

D. Failure by the Contractor to obtain the above observations shall place the responsibility on the Contractor for any relocation and/or replacement of planted trees or shrubs.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Plant label shall identify each species and variety. A label shall be attached to each individual plant or block of identical plants grouped together.

B. Adequately protect plants from sun and wind prior to planting. Do not allow stored plant material to dry out at any time.

C. Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at the site. Store materials and equipment in a location as directed by the Owner's Representative.

1.10 PESTICIDE NOTIFICATION

A. A written notification of any and all pesticide/herbicide products scheduled for use by the Contractor or their representative on the Owner's property must be submitted to the Owner's Representative at least seven days prior to the scheduled application. Notification shall include the product name, manufacturer's name, the pesticide active ingredient, the U.S. EPA and CalDPR registration numbers, the scheduled date and application areas, and the reason (target species) for the application.

1.11 REPAIR OF DAMAGED EXISTING PLANTING AREAS

A. The Contractor shall be responsible to repair all damage and/or distress to existing planting areas including turfgrass, shrubs, ground covers, perennials, etc., whether specifically shown on the Contract Documents or not, as a result of construction operations, material and/or equipment storage, site access, site offices, utility and/or irrigation line installations or other actions.

B. Replacement shrubs shall be 15 gallon size, replacement ground cover and perennial plants shall be 5 gallon size, and turfgrass shall be full width sod. Damaged areas shall be amended and finish graded per the Contract Documents prior to planting. Damaged areas outside of the limit of work shall be returned to the pre-construction condition with new replacement plants and/or turfgrass sod. Non-turfgrass planting areas shall also receive wood mulch as specified herein. The limits of repair shall be determined by the Owner.

## PART 2 - PRODUCTS

### 2.1 TOPSOIL

A. Topsoil used in planting areas shall be a clean, friable soil without noxious weeds, clods or stones larger than 0.5 inch in diameter, subsoil, hardpan, wood, debris, fine organic material greater than 2% by weight, undesirable insects, plant disease or any other natural or extraneous objects detrimental to normal plant growth.

B. The Contractor shall provide a particle size analysis, fertility testing and amendment recommendations of proposed native and/or import topsoil, and the Landscape Architect reserves the right to reject topsoil not conforming to the minimum specifications. Stockpiled onsite topsoil may be used if analysis and testing determines compliance with these requirements prior to placement. Failure to meet minimum specifications shall result in the removal of any unauthorized placed topsoil at the Contractors expense.

C. Particle size distribution for topsoil shall meet the following per ASTM D422:
1. 100% passing a 12.2 mm (1/2”) screen.
2. Minimum 95% passing a 9.5 mm (3/8”) screen.
3. Minimum 75% passing a 2.36 mm (No. 8) screen.
4. Maximum 45% passing a No. 200 screen.
5. Silt content shall be a maximum 35%.
6. Clay content shall be a maximum 25%.
7. Silt to Clay ratio shall be less than 2 and greater than 0.5.

D. Other characteristics shall conform to the following:
1. Permeability rate shall be not less than one (1.0) inch per hour or not more than 20 inches per hour.
2. The sodium absorption ratio (SAR) shall not exceed 3.0 and the electrical conductivity (ECe) shall not exceed 2.5 milliohms per centimeter at 25 degrees centigrade.
3. Soluble boron shall be no greater than 1.0 part per million (mg/l).
4. Soil pH range shall be 6.5 – 7.9.
5. Maximum concentration of soluble chloride shall be 150 parts per million.
6. Maximum concentration of heavy metals shall not exceed the following when the pH is between 6 and 7:
    a. Arsenic: 0.5 ppm
    b. Cadmium: 0.5 ppm
    c. Chromium: 5 ppm
    d. Cobalt: 1 ppm
    e. Lead: 15 ppm
    f. Mercury: 0.5 ppm
    g. Nickel: 2.5 ppm
    h. Selenium: 1.5 ppm
    i. Silver: 0.25 ppm
    j. Vanadium: 1.5 ppm
7. Petroleum hydrocarbons shall not exceed 100 mg/kg dry soil.
8. Aromatic volatile organic hydrocarbons shall not exceed 2 mg/kg dry soil.

### 2.2 SOIL AMENDMENTS

A. Organic Compost: “Harvest Premium” as supplied by Harvest Power (559) 435-1114; “WonderGrow Compost” by Grover, Inc. (866) 764-5765, or “Allgro Compost” by Synagro (559) 341-5158, or approved equal and conforming to the following minimums per the US Composting Council ‘Compost Technical Data Sheet’ report dated within one (1) month of the submittal date:
1. Certified as “Mature” or better

2. Pass EPA Class A standards for pathogens and heavy metals.
3. Particle size: 1/8" maximum
4. pH: 6.0-7.5.
5. Macro-nutrients: Minimum of 1.0% Nitrogen, 0.5% Phosphorus, 0.5% Potassium.
6. AgIndex ratio (Nutrients/Salts) 10 or more.
7. Ammonia N/Nitrate N ratio: rated Mature or Very Mature
8. Organic matter content greater than 50% dry weight.
9. Ash: equal or greater than 6%, not greater than 20%
10. Carbon/Nitrogen ratio: less than or equal to 25.
11. Salinity (ECe): less than 10.0 dS/m.
12. Odor shall be soil-like (musty, earthy) without any sour, ammonia-like or putrid smell.

B. Gypsum shall be mined agricultural grade gypsum composed of no less than 95% CaS04-2H20 hydrated calcium sulfate in a pelletized form. Elemental Sulfur shall be a minimum 95% pure agricultural grade.

C. Dry Humate organic soil conditioner comprised of a minimum 70% humic acid from Leonardite.

D. Endo 120 Mycorrhizae containing a minimum 60,000 living propagules per pound.

E. Amendment material types and application rates may be subject to change based on the findings and recommendations of the horticultural soil testing lab, and as such may result in an increase or decrease in the Contract Amount.

2.3 FERTILIZER

A. The pre-plant fertilizer shall be a commercial homogeneous, granular pellet:
1. Pre-plant fertilizer for turfgrass shall be:
a. BEST 6-24-24-5S XB+ with Avail

B. The maintenance fertilizer shall be a commercial homogeneous, granular pellet:
1. Maintenance fertilizer for turfgrass shall be one or more of the following:
a. Urea 46-0-0
b. BEST Ammonia Sulfate 21-0-0-24S, standard grade, or equal
c. BEST Nitra King 21-2-4-14S-2Fe, or equal.
d. BEST Nitex 20-2-3-12S-5Fe, or equal.
e. BEST Polyon 43 (43-0-0) slow release N, or equal.
f. Wil-Gro Pro Choice Plus, 31-3-7-6S-3Fe with 9.3% slow release N, or equal.
g. Best Landscape Color 14-14-14 (14-6-11.6-3S and micronutrients) with 9.9% slow release N, or equal.

C. Fertilizer material types and analysis may be subject to change based on the findings and recommendations from the horticultural soil testing lab, and as such may result in an increase or decrease in the Contract Amount.

2.4 TURFGRASS SOD

A. Sod shall be produced from certified or approved seed/stolons, fresh and labeled in accordance with U. S. Department of Agriculture Rules and Regulations. Sod quality shall be Premium or Standard Grade per TPI specifications. Harvested sod shall be big roll size.

B. Sod shall be neatly mowed and be mature enough that when grasped at one end it can be picked up and handled without damage, delivered to the project site, adequately protected and installation commenced within 24 hours of harvesting.

C. Turfgrass shall be a species and variety as specified in the Contract Drawings. If a warm-season grass is specified and the installation is to be performed between the months of October and April, a

species with an established perennial ryegrass overseeding shall be installed. Submit the overseeded product information for approval prior to the installation.

2.5 HERBICIDES

A. Herbicide products for removal of unwanted grass and broad-leafed weeds shall be registered and approved for use by the U.S. EPA and CalDPR, and shall comply with the Owner's Standards and with the "Healthy Schools Act" with current amendments, and with the current list of prohibited herbicides at Schools and Child Care facilities per California Assembly Bill 405.

B. Provide pre-emergent and post-emergent, selective herbicide formulations for use on turfgrass areas and/or ornamental shrub/ground cover areas that are not injurious to the proposed plantings and turfgrasses.

C. Provide a non-selective contact herbicide formulation only for use to remove existing established weeds prior to new plantings. The herbicide shall be certified for organic use, broad-spectrum with systemic function, 'Weed Slayer' by Agro Research International, or equal.

2.6 OTHER MATERIALS

A. Materials not specifically indicated, but necessary for proper execution of the work, shall be of first quality as selected by the Contractor subject to approval of the Landscape Architect.

**PART 3 - EXECUTION**

3.1 EXAMINATION & PREPARATION

A. General: Verify that existing site conditions are as specified and indicated before beginning this work.

B. Damaged Earth: Verify that earth rendered unfit to receive planting due to concrete water, mortar, limewater, hydrocarbons or any other contaminant dumped on it has been removed and replaced with clean earth from a source approved by the Owner's Representative.

C. Examine the area and conditions under which the work in this section is to be performed. Verify that any existing irrigation system within the limit of work is in proper working order with full coverage. Correct conditions detrimental to the timely and proper completion of the work. Do not proceed until unsatisfactory conditions have been corrected. Commencement of the work signifies acceptance of the existing conditions.

D. Protection:
1. Locate sewer, water, irrigation, gas, electric, phone and other pipelines or conduits and equipment within the area of work prior to commencing work.
2. Mark existing irrigation heads, valves, valve boxes and other below grade equipment or components that are scheduled to remain. Protect in place.

E. Runoff and Erosion Control: Furnish equipment, materials and labor necessary to control the flow, drainage, and accumulation of excess water running off the work area and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site per the approved SWPPP.

3.2 ROUGH GRADING, SOIL PREPARATION, PLANTER BACKFILL

A. Rough grading shall be performed by other subcontractors to the extent of establishing rough pads, slopes and drainage patterns. The Contractor is responsible for placement of topsoil and grading required to ensure positive drainage in all turfgrass and planting areas. All planting areas shall have a minimum topsoil depth of 18 inches from on-site native and/or approved import sources. Rough grading shall be completed prior to weed control, cross ripping or rock removal operations.

B. After the completion and acceptance of the weed control operations outlined below, and unless directed otherwise by the Landscape Architect or noted on the Drawings, and except for the area under the canopy of existing trees, the Contractor shall cross rip and till (break up large clumps and clods in excess of 2 inch diameter) the existing soil within all planting areas outside the canopy drip line of existing trees until the soil is loose and friable. Ripping shall be to a minimum depth of twelve inches (12") in turfgrass areas and eighteen inches (18”) in shrub/ground cover areas, with ripping tines a maximum 18” apart performed in a minimum of two passes total in different perpendicular directions. The Contractor shall review the completed ripping operation with the Owner’s Representative and Landscape Architect to determine compliance. The first 6 inches of any new topsoil fill shall be tilled into the existing soil to a minimum depth of 6 inches prior to placing any further topsoil fill. The Contractor shall provide any additional work as directed by the Owner’s Representative after the review to obtain compliance. Do not proceed with the addition of topsoil and/or amendments, or commence rock picking or fine grading until the completed ripping operation is accepted in writing by the Owner’s Representative.

C. Planting area soil under the canopy drip line of existing trees, or in planting beds not accessible by motorized equipment, shall be ripped to a minimum depth of 12 inches using manual spading shovels, forks and/or broadforks and working around major tree roots and/or utilities. In areas receiving new mulch, rip to a minimum depth of 4 inches while protecting any existing plants and their root system. Break up and/or remove rocks and clods as indicated below.

D. Do not work soil when moisture content is so great that excessive compaction will occur, or when it is so dry that dust will form in air or clods will not break up readily, or when a full ripping depth cannot be achieved. Apply water, if necessary, to bring soil to an optimum moisture content for tilling and dust control. Maintain within 2 percent above or below optimum moisture content for the existing soil type at all times during the work.

E. After soil ripping and preliminary finish grading is completed, the topsoil shall be cleared of all concrete, wire, sticks, roots, debris and foreign materials. Remove native stones and clods as follows:
1. In shrub/ground cover areas, remove stones and clods greater than one (1.0) inches in diameter from the top 3 inches of finish grade.
2. In general, non-play or sport turfgrass areas, remove stones and clods greater than three-quarter (0.75) inch in diameter from the top 2 inches of finish grade.
3. In designated play or sports field turfgrass areas, remove stones and clods greater than one-half (0.50) inch in diameter from the top 4 inches of finish grade using a mobile tractor pulled, PTO powered, hydraulic controlled rock picker, Cherrington Model 4500 or similar.

F. Add clean planting topsoil where needed to bring grade to elevation to promote positive drainage. Spread approved planting topsoil over ripped subgrade prior to incorporating amendments.

## 3.3 WEED CONTROL

A. Weed control pesticides shall only be applied by an individual holding a valid Qualified Applicator Certificate (Category A) issued by the Department of Pesticides Regulation.

B. The Contractor shall treat any weeds in proposed new turfgrass and planting areas with a non-selective contact weed killer at the manufacturer's approved rates and procedures prior to any commencement of work at the site including any irrigation work, ripping of soils or fine grading. Areas planned for turfgrass seed/stolon planting shall in addition receive “grow and kill” weed removal as outlined below.

C. Weed eradication shall be ongoing throughout the course of the landscape installation. The Contractor shall apply a pre-emergent herbicide after shrub/ground cover planting and prior to mulch installation. Manually remove weed seed heads. At no time will weeds be allowed to become established. Contractor shall provide all weed control operations as directed by the Owner’s Representative.

D. All weed control operations using pesticides/herbicides shall comply with the CalDPR and Owner Standards, as well as AB2260 “Healthy Schools Act”. The Contractor shall comply with the notification and posting requirements of the “Healthy Schools Act”.
   1. The Contractor shall notify the Owner per Subsection 1.10, A.
   2. The Contractor shall post highly visible signs around the treatment area in conformance with the “Healthy Schools Act” warning of a scheduled pesticide/herbicide application a minimum of 24 hours before to 72 hours after a pesticide application.

E. A non-selective contact herbicide for grassy weeds, ‘20% Vinegar Weed Slayer’ by Good Natured, CA DPR Reg# 85208-1-AA-42177, shall be applied directly to the weed foliage. Only apply to dry surfaces, and a minimum of 8 hours before a rain event. Allow a minimum of 14 days from herbicide application to commence any planting.

F. Perform pre-plant clearing and weed control for native open ground areas planned to receive planting as follows:
   1. Apply irrigation to encourage weed growth prior to ripping, and to maintain moisture in the soil.
   2. Apply a contact herbicide to weed foliage. Remove weeds and expose bare soil.
   3. Lightly disk/till to a depth of three-inches.
   4. Perform a “grow and kill” operation after the first disking/tillage:
      a. Water and lightly fertilize to encourage weed germination.
      b. Follow with a second application of a contact herbicide.
      c. Remove weeds and perform a light harrowing or disking.
   5. Apply irrigation to encourage weed growth. If additional weeds germinate, perform a second “grow and kill” operation.
   6. Once existing weeds are completely removed, obtain authorization from the Owner’s Representative to proceed with deep ripping, rock removal, soil conditioning and finish grading operations. Allow a minimum of 14 days from herbicide application to commence any planting.

G. After the shrub/ground cover planting is complete and prior to mulch installation, apply an approved pre-emergent herbicide per the manufacturer’s recommended rates.

## 3.4 SOIL CONDITIONING

A. Before commencement of any soil conditioning, weed and rock removal shall be completed as outlined above.

B. Uniformly amend the entire area of topsoil in turfgrass and mixed planting areas per the following bid rates and per the approved modifications as a result of the soils analysis recommendations:
   1. Turf and Non-Sloped (less than 4h:1v) Planting Area Soil Conditioning (per 1,000 square feet).
      a. Compost at a rate of six (6.0) cubic yards (a 2.0 inch thick layer).
      b. Gypsum at a rate of 100 pounds, or Sulfur at a rate of 25 pounds, or an equivalent combination.
      c. Humate soil conditioner at a rate of fifteen (15) pounds.
      d. A pre-planting fertilizer to turfgrass areas at a rate of 1.25 pounds of actual P and K.
      e. A pre-planting fertilizer to mixed planting areas at a rate of 1.5 pound of actual N.
      f. Mycorrhizae per Subsection 3.06, Mycorrhizae Application.

C. Till soil amendments into the entire planting area soil to a minimum depth of six (6) inches. Perform the cultivation in at least two passes, one in each perpendicular directions to the first, so that the amendments are homogeneously incorporated into the topsoil. All cultivation inside the dripline of existing trees shall be preformed manually with minimal disturbance to the root system.

D. If the contractor chooses amendments, conditioners, fertilizers and/or other materials that do not meet the specified characteristics, the contractor shall be responsible to obtain from the original sol testing lab recommendations to mitigate the out-of-spec material use. Any and all costs for testing

and providing the recommended mitigation measures shall be the responsibility of the contractor without any increase in the project cost or time.

E. Amendment material types and application rates may be subject to change based on the findings and recommendations of the horticultural soil testing lab, and as such may result in an increase or decrease in the Contract Amount.

3.5 FINE GRADING

A. Upon completion of soil preparation, fine grade all planting and turfgrass areas to a smooth and even slope conforming to and establishing drainage patterns per the approved Grading Plan. Grading shall eliminate all humps and hollows and promote positive drainage in all planting and turfgrass areas.

B. Where hardscape is installed in existing mixed planting areas, a minimum transition grade width of 2 feet adjacent to the edge of hardscape shall be constructed unless noted otherwise. The maximum slope of any transition grade in mixed planting areas shall be 20 percent (1v:5h). The area of transition grading shall be planted or repaired as specified herein.

C. Tolerance of grade differential for planting and general turfgrass areas shall be plus or minus 0.04 foot. If requested, the Contractor shall water test all turf and planting areas after the grading operations are completed in the presence of the Owner's Representative and/or Landscape Architect. The water test shall consist of applying water to the turf and planting areas to the point where water begins to run over the soil to show the drainage pattern. Make all corrections to the finish grading as required by the Owner's Representative to re-established positive drainage patterns. Acceptance of the finish grading shall be obtained in writing from the Owner's Representative and/or Landscape Architect prior to proceeding with soil conditioning and planting operations.

D. After the finish grading process, relative compaction of the soil in turf and planting areas shall range between 82% and 85% relative density. Compaction/moisture levels are generally acceptable if an Oakfield probe is able to penetrate a minimum of six inches into the cultivated planting topsoil with moderate pressure. The Owner reserves the right to require the Contractor to test for over compaction. If the compaction is within the acceptable range, the test will be paid for by the Owner. All testing due to non-compliance will be paid for by the Contractor.

E. Remove all rocks produced as a result of the soil conditioning and finish grading operations per the requirements of Subsection 3.02.

F. Finish grades shall be one-half inch (1/2") to three-quarter inch (3/4") for turfgrass sod areas, flush (0.0") for turfgrass seed/stolon areas and two inches (2") for shrub/ground cover planting areas below the finish surface of all adjacent walks, curbs, mowstrips and utility/valve boxes or collars. Transition any non-compliant grade in existing turfgrass areas at a maximum 12h:1v slope to meet finish grades above, unless shown otherwise on the grading plan.

3.6 MYCORRHIZAE AND HUMATE APPLICATION

A. In turfgrass planting areas, after fine grading is completed broadcast Mycorrhizae at a rate of one and one half (1.5) pounds per 1,000 square feet (65 lbs. per acre). Lightly rake into the top one inch (1") of topsoil immediately prior to turfgrass installation.

3.7 PLANTING

A. General Requirements
   1. Obtain written approval from the Landscape Architect or Owner's Representative to begin planting operations. The irrigation system shall be fully automated and operational, all weeding, soil conditioning and finish grading completed, and the tree and plant layout approved.

2. Planting shall be performed by workmen familiar with planting procedures and under the supervision of a qualified foreman. The planting foreman shall be on the job site al all times when planting is in progress.
3. Planting operations shall not occur under unfavorable weather conditions.
4. Boxed trees shall be planted first. Shrub planting shall be completed before groundcover is planted.
5. Proceed and complete the landscape work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of planting required.
6. Cooperate with other contractors and trades working in and adjacent to the planting work areas. Examine drawings which show the development of the entire site and become familiar with the scope of other work required.

B. Planting Preparation and Operations

1. Planting material shall be provided with adequate protection of root system and balls from drying winds and sun. Do not bend or bind trees or shrubs in such a manner as to damage bark, break or destroy natural shape. Provide protective covering during delivery.
2. Deliver trees and shrubs after preparations for planting have been completed, and plant immediately. If planting is delayed more than six (6) hours after deliver, set trees and shrubs in shade, protect from weather and mechanical damage and keep roots moist. Do not remove container grown stock from containers until planting time.
3. All planting areas shall be smooth and even. Finish grades shall be done prior to any placement of plants.
4. Place all trees and shrubs in locations shown on the planting plan and obtain written field approval of the Landscape Architect before planting or digging planting pits. Inform the Landscape Architect seven (7) days prior to placing the plants. Maintain a minimum 15 foot clearance from trees to any light pole, unless specifically noted otherwise.
5. Carefully remove all canned stock from containers with tin snips or approved cutter. Cut away and remove any girdled or matted roots.
6. Excavate holes of circular outline with vertical sides for all plants 15 gallon or less. Boxed trees shall have square planting holes. The vertical sides and bottom of the holes shall be thoroughly scarified to promote union of backfill with existing soils. All trees shall have two drainage sump holes drilled with a twelve inch (12") diameter auger penetrating hardpan layers to a minimum one (1) foot into a sand/gravel layer or to a minimum depth of ten (10) feet below the planting pit bottom. Precautions shall be exercised to avoid smooth sides on the holes. Offset augured holes a minimum of eighteen inches (18") from planned tree location to avoid settling of tree after planting.
7. After cleaning out the sump holes, the Contractor shall test the sumps for drainage by flooding with water. If the water does not drain out within twenty-four (24) hours, auger down as required to achieve such drainage by breaking through the hardpan layer, or by extending the drainage sumps to a minimum depth of 15 feet below the bottom of the planting pit. After obtaining approval of the sump holes, fill the augured drainage sump holes with coarse concrete sand.
8. Tree and shrub planting pits shall be at least two and one half (2.5) times the width of the plant container, but a minimum of 36” wide for trees and 18” wide for container shrubs. Planting pits shall be as deep as the soil depth in the container or box, less the additional height of the crown above the finish grade.
9. Set each plant in the center of the pit, plumb and straight. Set the crown of the plant at one inch (1") for shrubs, two inches (2”) for trees above finish grade. When 1/2 of the backfill mix has

been placed, tamp-in, insert fertilizer (BEST PAKS as per Section 2.1B1) and allow no air pockets as remainder of backfill is added.

10. Compact soil around the rootball of all plants and thoroughly water in the entire backfill depth.
11. Excess soil from plant holes shall be cultivated and raked to a smooth outline.
12. Shrubs and groundcovers shall be installed in relation to walks and paving to allow for future growth without obstructing traffic with clearance as shown on the drawings.
13. All plants shall be set in watering basin which shall be as wide as the planting pit, but at least four feet (4') in diameter and four inches (4") deep for trees and two feet (2') in diameter and three inches (3") deep for shrubs and vines.
14. Ground cover plants shall be planted at the spacing noted on the drawings. Not more than fifteen minutes shall elapse from the time any groundcover plant is planted until it is watered.

C. Pruning: Prune plants in accordance with established horticultural practice. Shearing of any plants will not be acceptable. Tree pruning shall only be performed with the written approval of the Landscape Architect and under the direction of a certified arborist, and shall comply with ISA Pruning Standards (ANSI 300).

3.8 MULCH

A. Prior to any mulch application, perform weed control operations as specified herein.

B. Install a minimum 3” compressed layer of wood mulch at a minimum 3’ radius from the tree trunk of all trees located in turfgrass areas. Provide a smooth finish grade transition to a 2” compressed depth where the mulch meets the turfgrass, so that the top elevation of the mulch is flush to the turfgrass soil. Keep mulch off the trunk. For new trees in turfgrass areas, remove the watering berm just prior to the turfgrass planting but maintain the mulched area within the planting pit.

3.9 TURFGRASS SOD

A. The area to be planted shall be finish graded to present a smooth and even surface free of humps and hollows and conforming to the finish grading plans. Where new sod is abutting existing turfgrass, fine grade to allow for the thickness of the new sod soil so that the new and existing sod grades are flush. Immediately prior to planting, the surface of the area to be planted shall be sufficiently loose and friable, with adequate moisture to receive the sod. Avoid laying sod on hot or dry soil.

B. Lay first strip of sod slabs along a straight line (use a string in irregular areas). Butt joints tightly. Do not overlap edges. On second strip, stagger head joints (similar to a running bond brick pattern). Use a sharp knife to cut sod in order to fit curves, edges, and sprinkler heads.

C. As the sod is being installed, water the sod lightly to prevent drying out. Continue to lay sod and lightly water until installation is complete.

D. After laying sod, roll to eliminate irregularities and to form good contact between sod and soil. Avoid a too heavy roller or excessive initial watering which may cause roller marks.

E. Water the completed lawn surface thoroughly. Topsoil should be constantly moist for a minimum two inches deep. Repeat irrigating at regular intervals to keep sod moist until rooted. The areas shall not be watered to the extent of saturating the soil and causing "flotation" or "flowing" of the top surface of the soil. After water has once been applied, no portion of the planted areas shall be allowed to dry out during the entire maintenance period. After sod roots are established, decrease frequency and increase amount of water per application as necessary to maintain good soil moisture to a minimum 6” depth without standing water or excess runoff. The Contractor shall be responsible to monitor the site and alter the watering times and frequencies to meet site and climatic conditions.

F. Prior to the start of the maintenance period, fill all seam joint gaps greater than 1/8 inch and less than 0.5 inch with washed plaster sand. Fill any joint gaps of 0.5 inch or greater width with a minimum two foot long replacement sod section in order to achieve a tight joint.

G. Replace dead or distressed sod with equivalent material as directed by the Landscape Architect.

H. Do not install turfgrass inside the watering basin of new trees planted in turf areas, or within a 3' radius of existing tree trunks located in turf areas.

3.10 CLEAN-UP AND REPAIR

A. All areas shall be maintained in a neat and orderly condition at all times. All reasonable precautions shall be taken to avoid damage to existing planting and structures. Disturbed and/or damaged areas, whether a part of this work or from the work of other trades, shall be restored to their original condition.

B. Plants and/or turfgrass shown to remain and damaged or removed by construction operations and/or utility/electrical/drainage lines shall be replaced with plants that match as closely as possible to the existing plant species, variety and size. The replacement turfgrass sod variety shall be the same as shown in the Planting Legend if for new work, or shall match the existing turfgrass variety where the turfgrass is existing. Adjust the finish grade so that the new turfgrass sod abuts flush to the existing turfgrass or to hardscape. The replacement plants and/or turfgrass sod shall be maintained as part of the original scope of work.

C. After the planting operations are completed, the Contractor shall remove all trash, excess soil, empty containers or any other debris accumulated by the work from the site. All damage caused by the work shall be repaired at the Contractor's expense and the site shall be left in a neat and orderly condition to the satisfaction of the Owner.

3.11 PRE-MAINTENANCE REVIEW

A. A general review will be held prior to the start of the maintenance period upon conclusion of the planting operations, irrigation system installation and after clean-up has occurred. The Owner's Representative shall be informed in writing a minimum of seven (7) working days prior to the time the work is ready for review in order to arrange a suitable time and date for such review.

B. At the time of review, Contractor shall have all planting areas free of weeds and neatly cultivated and fine graded. All plant basins shall be in good repair. All trees shall be properly staked and tied. All planting areas shall be clear of weeds.

C. The establishment of turfgrass is herein defined as being all work necessary to grow a full, healthy, uniform stand of smooth and even texture and grade with clean straight edges without weeds, distressed areas or bare spots, and has been mowed at least twice per the specifications. The establishment of turfgrass is further defined as being all work necessary to develop a minimum rooting depth of 2 inches into site soil for a majority of the profile sample section.

D. Work requiring corrective action or replacement in the judgment of the Owner's Representative shall be performed within five (5) days after the inspection. Corrective work and materials replacement shall be in accordance with the drawings and specifications and shall be made by the Contractor at no cost to the Owner. A subsequent review shall then be arranged.

E. If after the review, the Landscape Architect is of the opinion that all the work has been performed as per the Contract Documents, and a uniform stand of healthy dense turfgrass has been established without weeds or bare spots, the Contractor will be given written notice that the maintenance period may begin.

3.12 MAINTENANCE - GENERAL

A. After all work indicated on the drawings or herein specified has been completed, reviewed, and approved, and the turfgrass has been successfully established per the requirements below, the Contractor shall commence a sixty (60) calendar day maintenance period in which the Contractor shall continuously maintain all areas included in the contract during the progress of the work and throughout the maintenance period, or until Final Acceptance of the project, whichever is greater.

B. Establishment and maintenance work includes monitoring the site to control all watering, replanting, fertilizing, mulching, weeding, cultivating and mowing necessary to bring the planted areas to a healthy and vigorous growing condition, and any additional work needed to keep the areas neat, edged, weed and trash free, and attractive.

C. Any date when the Contractor fails to adequately water, replace unsuitable planted areas and other work determined to be necessary by the Owner, will **NOT** be credited as part of the establishment/maintenance period.

D. No additional payment will be made for additional time necessary for turfgrass establishment. The maintenance period shall not start until all contract work has been completed and all close-out documents and materials have been submitted. Turfgrass will be considered weed-free if there is a maximum of one percent undesirable turfgrass species, and nine weeds or less per 50 square yards (one per 50 square feet).

E. During the progress of the maintenance period, the Contractor and the Owner's Representative shall conduct reviews at no less than 21-day intervals to determine that ongoing maintenance activities have been conducted by the Contractor. If in the opinion of the Owner, ongoing maintenance has not been conducted by the Contractor in a satisfactory manner the maintenance period shall be suspended. The Contractor shall provide remedial work as directed by the Owner's Representative to correct the found deficiencies and schedule another review. If after the subsequent review the work is deemed acceptable, the maintenance period shall resume.

3.13 MAINTENANCE – MOWING AND DRESSING

A. The first two mowings of warm-season Bermudagrass varieties grown from seed/stolons shall commence when the grass is two (2) inches tall and cut down to one and one-half (1.5) inch. Mowing height for the second two mowings shall be when 1.75 inch tall and cut down to 1.25 inch. The next two mowing shall be when 1.4 inch tall and cut down to 1.0 inch. For all subsequent mowing and for new sod, mow when 1.125 inch tall and cut down to 0.75 inch.

B. The first two mowings of warm-season Bermudagrass varieties grown from seed/stolons shall commence when the grass is two (2) inches tall and cut down to one and one-half (1.5) inch. Mowing height for the second two mowings shall be when 1.75 inch tall and cut down to 1.25 inch. For all subsequent mowing and for new sod, mow when 1.4 inch tall and cut down to 1.0 inch.

C. The first three mowings of Tall Fescue cool-season grass varieties shall commence when the grass is three and one-half (3.5) inches tall and cut down to three (3.0) inches. For all subsequent mowings, mow when 3.25 inches tall and cut down to 2.5 inches.

D. The first three mowings of temporary or overseeded cool-season grass varieties shall commence when the grass is two and one-half (2.5) inches tall and cut down to one and three quarters (1.75) inches. For all subsequent mowings, mow when the grass is 2.25 inches tall and cut down to one and one-half (1.5) inch.

E. Turfgrass areas shall be mowed during the growing season a minimum of twice a week for warm-season varieties and a minimum of once a week for cool-season varieties, or at any time the grass reaches 1.4 times its mowing height. Turfgrass shall be edged weekly. The Contractor shall coordinate his watering and weed control schedules to accommodate his mowing schedule. If the Contractor is unable to mow the turf areas on the required day, he has until 5:00 pm of the next day to do the

work. After that time, the Owner reserves the right to secure the services of an alternate mowing entity to perform the work. The cost for the alternate mowing will be deducted from monies owed to the Contractor. The Contractor will remain responsible to perform all scheduled mowings and maintenance of the site. The turfgrass shall be mowed and edged, and all trash and debris removed prior to Final Acceptance.

F. Thirty days after the start of the maintenance period, team sports fields shall be topdressed and dragged with USGA topdressing sand at a rate of 1.15 tons per 1,000 square feet (+0.25 inch depth). Drag and roll all topdressed turfgrass areas with a lightly weighted turf roller in order to provide a smooth and even mowing surface. Additional topdressing may be required later in the maintenance period if the finish grade planarity is not acceptable.

3.14 MAINTENANCE - FERTILIZATION

A. The Contractor shall fertilize the warm-season turfgrass (Bermudagrass) at the start of the maintenance period and every twenty-eight (28) days with the turfgrass maintenance fertilizer at a rate of 1.5 lb. of actual N, and/or P and/or K /1,000 s.f. and as modified by the soil fertility recommendations and as directed by the Landscape Architect. The Contractor shall allow for at least three separate fertilizer formulation applications in each fertilization operation. The Contractor shall continue the fertilizer applications until the established turf is accepted.

B. The Contractor shall fertilize the temporary cool-season turfgrass at the start of the maintenance period every twenty-eight (28) days with the turfgrass maintenance fertilizer at a rate of 1.0 lb. of actual N, and/or P and/or K /1,000 s.f. and as modified by the soil fertility recommendations and as directed by the Landscape Architect. The Contractor shall allow for at least three separate fertilizer formulation applications in each fertilization operation. The Contractor shall continue the fertilizer applications until the established temporary turf is accepted.

C. The Contractor shall fertilize the turfgrass areas during the last week of the maintenance period with the turfgrass maintenance slow-release N fertilizer (43-0-0) at a rate of three and one-half (3.5) lbs./1,000 s.f. and as modified by the soil fertility recommendations and as directed by the Landscape Architect. The Contractor shall allow for at least three separate fertilizer formulation applications in each fertilization operation.

3.15 MAINTENANCE – REPAIR AND WEEDING

A. Between the twenty-first (21) day and the twenty-eigth (28) day after turfgrass planting, the Contractor shall perform the following: replant all spots or areas where normal germination or growth is not evident; remove all rocks or other debris that would constitute a hindrance to mowing or cultivating; repair all damage done by his operations. Where poorly compacted trench backfill shows settlement, remove turfgrass or plants, fill all depressions and eroded channels with sufficient conditioned topsoil to raise to proper grade, compact lightly and replant the filled areas. Roll all planted or replanted turfgrass areas with a lightly weighted turf roller in order to provide a smooth and even mowing surface.

B. Visible weeds shall be removed at least weekly during the maintenance period. At the end of the maintenance period, all planting areas shall be without weeds. If weeds are present, the Contractor shall manually remove the weeds and shall then apply a granular, selective pre-emergent herbicide at manufacturer's approved rates. Coordinate application with the Owner’s Representative and provide certificates of application to Owner’s Representative. The turfgrass will be considered weed-free if there are 9 weeds or less per 50 square yards (one per 50 square feet).

3.16 FINAL REVIEW

A. A Final Review will not be scheduled until all Close-out Documents and materials have been submitted and accepted.

B. A Final Review will be performed before the end of the Maintenance Period or upon the pending Final Acceptance of the work, whichever is earlier, provided all deficiencies revealed during the maintenance period have been corrected. If deficiencies have not been corrected by the end of the stated maintenance period, the Contractor shall continue to fully maintain the project at his own expense. After all deficiencies have been corrected, a Final Review will be held with the Landscape Architect, Owner's Representative, and Contractor.

C. Final Acceptance of turfgrass is contingent on a weed free, healthy uniform stand without dead, bare or distressed areas with a minimum rooting depth of five (5) inches into site soil.

D. If after the Final Review, the Landscape Architect and Owner's Representative are of the opinion that the work is acceptable and complete, the Contractor's maintenance responsibility shall terminate on an agreed upon date.

3.17 WARRANTY AND REPLACEMENT

A. All trees and plants provided under this Contract shall be guaranteed to be in good, healthy, disease/pest free and in a flourishing condition one growing year from the date of Final Acceptance of the work, provided the Owner maintains the plants properly and in accordance with accepted horticultural practices. Species and size of any tree and/or plant replacements, either prior to or after Final Acceptance, shall be equal to that of the same adjacent trees and/or plants at the time of replacement as determined by the Landscape Architect.

B. The Contractor shall be responsible to replace all lost plants due to theft, vandalism or any other preventable causes till Final Acceptance of the work by the Owner. Replacement trees and plants shall be planted as originally specified and detailed. Replacement trees and plants shall be guaranteed as specified above from the date of replacement. The maintenance period may be extended for a duration of not more than the original maintenance period duration for the establishment of replacement plants.

C. The Contractor shall be held responsible for repair and/or replacement of damages to new or existing improvements resulting from the defects or actions of trees, plants, materials, equipment or workmanship one year from the date of Final Acceptance or the Notice of Completion, whichever is later.

END OF SECTION

**SECTION 33 4000 - STORM DRAINAGE UTILITIES**

**PART 1 - GENERAL**

1.1 SUMMARY

A. Provide storm sewage system where shown on the drawings, including pipe, manholes, cleanout and inlet structures, placing and compacting pipe bedding, final backfilling, compaction and grading. as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
2. Section 01 5000: Temporary Facilities and Controls.
3. Section 01 5725: Storm Water Pollution Protection Plan.
4. Section 01 7330: Cutting and Patching.
5. Section 31 2000: Earthwork.
6. Section 32 1210: Asphaltic Concrete Paving.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements. Provide Certificates of compliance for material.
2. Installation Procedures: Submit manufacturer's recommended installation procedures.
3. Manufacturer's Installation Instructions: Indicate special procedures required to install products supplied.

1.3 QUALITY ASSURANCE

A. All improvements within property owned by a City, County or State Entity shall be in accordance with the Standard Specifications of the authority having jurisdiction.

1.4 COORDINATION

A. Verify that the location of existing utilities have been indicated at work site by utility authorities and the Owner.

1.5 EXISTING UTILITIES

A. The Engineer has made a diligent attempt to indicate on the plans the location of all main and trunkline utility facilities which may affect the Work. In most cases, however, the only available information relative to the existing location of said facilities was small scale undimensioned plats. The location of said facilities, therefore, shall be considered approximate only, until exposed by the Contractor.

B. Service laterals and appurtenances have also been shown where information was available as to their location. In most cases, however, the only available information relative to the existing location of said facilities was small scale undimensioned plats. The location of said facilities, therefore, shall be considered approximate only, until exposed by the Contractor.

C. At new work locations, expose by hand methods all existing utilities along the route of the new work prior to using any mechanical equipment. If mechanical equipment is allowed at a particular location, it may only be used after the completion by the Contractor of a successful exhaustive search by hand methods to locate all existing facilities as indicated on the plans, and as indicated at the work site by District personnel.

D. Maintain all existing utility mains and service lines in constant service during construction of the Work.

**PART 2 - PRODUCTS**

2.1 PIPING MATERIALS

A. Storm drain piping shall be reinforced concrete pipe (RCP), polyvinyl chloride pipe (PVC), or high density polyethylene pipe (HDPE), unless a piping material is specifically designated on the Drawings.

2.2 REINFORCED CONCRETE PIPE MATERIALS

A. Reinforced Concrete Pipe (RCP): ASTM C76; bell-and-spigot ends and gasketed joints with ASTM C443 rubber gaskets; appropriate pipe class shall be determined by the depth of cover listed below unless noted otherwise on the Drawings.
   1. Class III, Wall B minimum for cover depths from 2 feet to 3 feet.
   2. Class II, Wall B minimum for cover depths greater than 3 feet up to 9 feet.
   3. Class III, Wall B minimum for cover depths of greater than 9 feet up to 14 feet.
   4. Class IV, Wall B minimum for cover depths of greater than 14 feet up to 20 feet.
   5. Class V, Wall B minimum for cover depths greater than 20 feet up to 30 feet.

B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

C. Flexible Watertight Joints: Rubber compression gasket joints, ASTM C443.

2.3 POLYVINYL CHLORIDE PIPE MATERIALS

A. Polyvinyl Chloride Pipe: ASTM D3034, SDR 35, Type PSM; bell and spigot style joint end.

B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

C. Flexible Watertight Joints: Provide rubber type gaskets for PVC pipe; ASTM 3212.

2.4 HIGH DENSITY POLYETHYLENE (HDPE) PIPE MATERIALS

A. High Density Polyethylene Pipe (HDPE): Corrugated exterior, smooth interior pipe; ASTM D1248, Type III, Category 4, Grade P33, Class C; or ASTM D3350 cell classification 324420C.
   1. 4” to 10” diameter pipe shall meet the requirements of AASHTO M252.
   2. 12” to 36” diameter pipe shall meet the requirements of AASHTO M294, Type S.
   3. 42” and 48” diameter pipe shall have a minimum pipe stiffness of 19 PSI and 17 PIS respectively, at 5% deflection in addition to the requirements of AASHTO M294.
   4. A rubber or neoprene gasket shall be installed at all joints.

B. Fittings:
   1. Shall not reduce or impair the overall integrity of the pipe.
   2. May be either molded or fabricated.
   3. Couplings shall have sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joint.
   4. Only fittings supplied or recommended by the pipe manufacturer shall be used.
   5. A rubber or neoprene gasket shall be installed at all joints.

2.5 DRAINAGE STRUCTURES

A. General: Construct manholes, inlets, and junction structures of reinforced concrete or precast reinforced concrete, complete with metal frames and covers or gratings, and with fixed ladder rungs, and mortared joints where indicated on the Drawings.

B. Concrete: 2500 psi reinforced concrete as specified in Section 03 3000, unless otherwise noted on the Drawings.

C. Mortar for pipe joints and connections to other drainage structures, and manhole construction:
1. ASTM C270, type M, except the maximum placement time shall be one hour.
2. Hydrated lime complying with ASTM C141, type B, may be added to the mixture of sand and cement in an amount equal to 25% of the volume of cement used.
3. Provide a quantity of water in the mixture sufficient to produce a stiff workable mortar, which shall be clean and free from harmful acids, alkalis, and organic impurities. Use the mortar within 30 minutes after water is added to the mix.

D. Frames, Covers, and Gratings: Cast iron; ASTM A48, Class 25.:
1. Provide all gratings or covers from the same manufacturer.
2. Provide ADA compliant grates where located in walking surfaces; with spaces no greater than 1/2" wide in one direction. Orient elongated openings perpendicular to dominant direction of travel.

E. Precast Reinforced Concrete Manhole Sections: ASTM C478; resilient connectors, ASTM C 923; elliptical single line reinforcement is not allowed unless shown on detail drawing.

2.6 TRENCH BEDDING MATERIAL

A. Sand: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.

**PART 3 - EXECUTION**

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Identify location of proposed storm drainage facilities to be constructed. Expose connection points to existing system. Locate, identify, and protect existing above and below grade utilities from damage. Protect plant life, lawns, trees, shrubs, and other features not authorized for removal.

C. Employ equipment and methods appropriate to the work site. Protect excavated areas from drainage inflow, and provide drainage to all excavated areas. Dewater existing drainage basins and existing drainage pipeline systems as necessary to accomplish the work. Remove all interfering surface and subsurface improvements authorized for removal.

D. **PROVIDE WATER AND WATER TRUCK OR OTHER METHODS OF MITIGATING EXCESSIVE DUST ON THE SITE. KEEP SITE DAMP ENOUGH TO MINIMIZE POWDERING DIRT AND AIRBORNE DUST.**

E. Comply with Public Works Standards of the governing jurisdiction or these specifications, whichever is more stringent.

3.2 EXCAVATING, TRENCHING, AND BEDDING

A. Excavate, trench, and bed for site drains in accordance with pertinent provisions of Section 31 2000.

3.3 PIPE INSTALLATION

A. General:
   1. Carefully examine each pipe prior to placing.
      a. Promptly set aside defective pipe and damaged pipe.
      b. Clearly identify defects.
      c. Do not install defective pipe or damaged pipe.
      d. Install the pipe and fittings to the lines and grades shown on the construction plans.
   2. Place pipe to the grades and alignment indicated, with a tolerance of one in 1000 vertical and one in 500 horizontal, unless otherwise directed by the Architect.
   3. Provide adequate facilities for lowering pipe safely into the trenches.

B. Install pipe and fittings in accordance with the manufacturer's recommendations, and these specifications.
   1. Unless otherwise approved by the Engineer, lay all pipe upgrade from structure to structure, with bell or socket ends of pipe upgrade.
   2. Excavate suitable bell (or socket) holes in the bedding material, so that the bells do not bear on the subgrade or bedding. Provide uniform bearing of pipe barrel on bedding material.
   3. Ensure that all joints are properly "homed" and are watertight.
   4. Bed concrete pipe in sand envelope, and compact. Place and compact the bedding material under, around and over the pipe, filling the trench cavity and extending from the bottom of the trench (6" below the outside bottom of the pipe barrel) to a level 12" above the outside top of the pipe barrel.
   5. Do not place pipe in water, nor place pipe when trench or weather is unsuitable for such work.

C. High Density Polyethylene Pipe Installation: Installation shall be in accordance with ASTM 2321-89.

D. Utility Identification Tape:
   1. Provide metallic plastic caution ribbon in trench approximately 12" above the top of the pipe indicating "CAUTION STORM SEWER".
   2. Run ribbon continuous from inlet or manhole to each vertical structure.

3.4 DRAINAGE STRUCTURE INSTALLATION

A. Install drainage structures in accordance with the Drawings and with the manufacturer’s written installation instructions.

B. Form bottom of excavation clean and smooth to correct elevation.

C. Level top surface of base pad; sleeve concrete shaft sections to receive pipe sections.

D. Establish elevations and pipe inverts for inlets and outlets as indicated.

E. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.5 MANHOLE INSTALLATION

A. Place concrete base pad, trowel top surface level.

B. Place pre-fabricated manhole sections plumb and level, trim to correct elevations, anchor to base pad.

C. Form and place cast-in-place manhole cylinder plumb and level, to correct dimensions and elevations. As work progresses, build in fabricated metal items.

D. Cut and fit for pipe.

E. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.

F. Set cover frames and covers level without tipping, to correct elevations.

G. Coordinate with other sections of work to provide correct size, shape, and location.

3.6 BACKFILLING

A. Backfill and compact in accordance with pertinent provisions of Section 31 2000.

3.7 TESTING AND INSPECTING

A. Provide personnel and equipment necessary, and perform tests required to demonstrate that the work of this Section has been completed in accordance with the specified requirements.

B. Hydrostatic Test on Watertight Joints:
   1. Test joints within the building area and outside the building area but within ten feet of exterior walls or faces of the buildings.
   2. Make a hydrostatic test on each watertight joint. Test one sample of each type watertight joint used. If one sample fails because of faulty workmanship, test an additional joint.
   3. Demonstrate that joints in reinforced and unreinforced concrete pipe comply with ASTM C443-01.
   4. Comply with ASTM C425 for tests of joints in clay pipe.
   5. Make tests in concrete pipe at an internal hydrostatic pressure of 10 psi for 24 hours.
   6. Replace or repair joints found to be faulty. Repeat the test and repair cycle until joints are demonstrated to meet the specified requirements.

**END OF SECTION 33 4000**