

PROJECT MANUAL FOR:

**MULTI-PURPOSE BUILDING
FAIRMEAD ELEMENTARY SCHOOL
FAIRMEAD, CALIFORNIA**

**Doug Collins
Superintendent**

**CHOWCHILLA ELEMENTARY SCHOOL DISTRICT
355 N. 5th Street
Chowchilla, California 93610**

PREPARED BY:



GONZALEZ ARCHITECTS

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C-12865 ARCHITECTURE & PLANNING PROJECT NO. 2318

4/12/24

TITLE PAGE

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FAIRMEAD ELEMENTARY SCHOOL
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**CHOWCHILLA ELEMENTARY SCHOOL DISTRICT
355 N. 5th Street
Chowchilla, California 93610**

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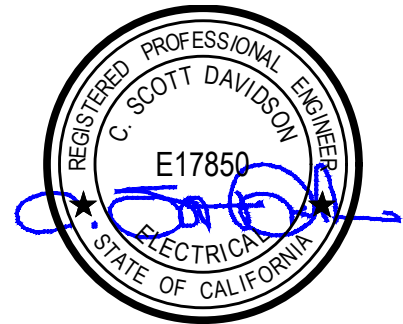


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FOR
MULTI-PURPOSE BUILDING
AT
FAIRMEAD ELEMENTARY SCHOOL

GA. Project No. 2318
DSA Application No. 02-121993

CHOWCHILLA ELEMENTARY SCHOOL DISTRICT

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NOTICE INVITING BIDS

CHOWCHILLA ELEMENTARY SCHOOL DISTRICT

MULTI-PURPOSE BUILDING AT FAIRMEAD ELEMENTARY SCHOOL

NOTICE IS HEREBY GIVEN that the Chowchilla Elementary School District, acting by and through its Governing Board, hereinafter referred to as "School", will receive prior to **3:00 p.m. on May 9th, 2024** sealed bids for the award of a Contract for the following:

MULTI-PURPOSE BUILDING AT FAIRMEAD ELEMENTARY SCHOOL

All bids shall be made and presented only on the forms presented by the School. **Bids shall be received in the District Office located at 355 N. 5th Street, Chowchilla, CA 93610**, and shall be opened and publicly read aloud at the above state time and place. Any bids received after the time specified above or after any extensions due to material changes shall be returned unopened.

The Contract Time is 240 Calendar Days

Contractor should consult the General Conditions, Supplementary Conditions, and General Requirements regarding Milestones and Liquidated Damages.

The bid documents are available starting 04/13/2024 and may be obtained or reviewed by contacting Juan M. Gonzalez, Gonzalez Architects by telephone at (559) 497-1542 or electronic mail at juang@gonzalez-architecture.com. Bid documents are also available at Local Building Exchanges.

There will be a \$200.00 non-refundable charge to purchase each set of bid documents. No partial sets will be available.

There will be a **Mandatory Pre-Bid Conference at 3:30 p.m. on 4/23/2024 at Fairmead Elementary School located at 19421 Avenue 22 3/4 Chowchilla, CA 93610**. Any Contractor bidding on the Project who fails to attend the entire mandatory job walk and conference will be deemed a non-responsive bidder and will have its bid returned unopened.

Each bidder shall be a licensed contractor pursuant to the California Business and Professions Code, and be licensed to perform the work called for in the Contract Documents. The successful bidder must possess a valid and active **Class B License** at the time of bid and throughout the duration of this Contract. The Contractor's California State License number shall be clearly stated on the bidder's proposal

Subcontractors shall be licensed pursuant to California law for the trades necessary to perform the Work called for in the Contract Documents.

Each bid must strictly conform with and be responsive to the Contract Documents as defined in the General Conditions.

The School reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding.

Deductive Bid Alternates (See Section 13 of Instruction to Bidders)

If the District has included deductive alternates which require all bidders to price as part of their bid, the District will utilize the following method to determine the lowest bidder in accordance with Public Contract Code section 20103.8:

- The lowest Base bid shall be the lowest Base bid price on the base contract without consideration of the prices on the deductive items.

****Note:** Pursuant to Public Contract Code section 20103.8, the selection process selected does not preclude the District from using any of the additive or deductive alternates from the Contract after the lowest responsible responsive bidder has been determined.

Each bidder shall submit with its bid — on the form furnished with the Contract Documents — a list of the designated subcontractors on this Project as required by the Subletting and Subcontracting Fair Practices Act, California Public Contract Code section 4100 et seq.

In accordance with California Public Contract Code section 22300, the School will permit the substitution of securities for any moneys withheld by the School 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 School, or with a state or federally chartered bank as the escrow agent, who shall then pay such moneys to the Contractor. Upon satisfactory completion of the Contract, the securities shall be returned to the Contractor.

Each bidder's bid must be accompanied by one of the following forms of bidder's security: (1) cash; (2) a cashier's check made payable to the School; (3) a certified check made payable to the School; or (4) a bidder's bond executed by a California admitted surety as defined in Code of Civil Procedure section 995.120, made payable to the School in the form set forth in the Contract Documents. Such bidder's security must be in an amount not less than ten percent (10%) of the maximum amount of bid as a guarantee that the bidder will enter into the proposed Contract, if the same is awarded to such bidder, and will provide the required Performance and Payment Bonds, insurance certificates and any other required documents. In the event of failure to enter into said Contract or provide the necessary documents, said security will be forfeited.

The Contractor and all Subcontractors shall comply with the requirements set forth in Division 2, Part 7, Chapter 1 of the Labor Code. The School has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this work is to be performed for each craft, classification or type of worker needed to execute the Contract. These per diem rates, including holiday and overtime work, as well as employer payments for health and welfare, pension, vacation, and similar purposes, are on file at the School, and are also available from the Director of the Department of Industrial Relations. Pursuant to California Labor Code section 1720 et seq., it shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractor under such Contractor, to pay not less than the said specified rates to all workers employed by them in the execution of the Contract.

A Contractor or Subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in the Labor Code, unless currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by

Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

The Contractor and all subcontractors shall furnish certified payroll records as required pursuant Labor Code section 1776 directly to the Labor Commissioner in accordance with Labor Code section 1771.4 on at least on a monthly basis (or more frequently if required by the School or the Labor Commissioner) and in a format prescribed by the 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).

No bidder may withdraw any bid for a period of ninety (90) calendar days after the date set for the opening of bids.

Separate Payment and Performance Bonds, each in an amount equal to 100% of the total Contract amount, are required, and shall be provided to the School prior to execution of the Contract and shall be in the form set forth in the Contract Documents.

All bonds (Bid, Performance, and Payment) must be issued by a California admitted surety as defined in California Code of Civil Procedure section 995.120.

Bidders must meet the requirements set forth in Public Contract Code section 10115 et seq., Military and Veterans Code section 999 et seq. and California Code of Regulations, Title 2, Section 1896.60 et seq. regarding **Disabled Veteran Business Enterprise (“DVBE”) Programs**. Forms are included in this Bid Package.

Any request for substitutions pursuant to Public Contract Code section 3400 must be made at the time of Bid on the Substitution Request Form set forth in the Contract Documents and included with the bid.

No telephone or facsimile machine will be available to bidders on the School premises at any time.

It is each bidder’s sole responsibility to ensure its bid is timely delivered and received at the location designated as specified above. Any bid received at the designated location after the scheduled closing time for receipt of bids shall be returned to the bidder unopened.

Advertise: April 13 2024 and April 20, 2024

CHOWCHILLA ELEMENTARY SCHOOL DISTRICT

INSTRUCTIONS TO BIDDERS

1. **Preparation of Bid Form.** Proposals under these specifications shall be submitted on the blank forms furnished herewith at the time and place stated in the Notice Inviting Bids. All blanks in the bid form must be appropriately filled in, and all proposed prices must be stated clearly and legibly in both words and numerals. All bids must be signed by the bidder in permanent blue ink and submitted in sealed envelopes, bearing on the outside, the bidder's name, address, telephone number, and California Contractor's License number, and the name of the Project for which the bid is submitted. The District reserves the right to reject any bid if all of the above information is not furnished. It is each bidder's sole responsibility to ensure its bid is timely delivered and received at the location designated as specified above. Any bid received at the designated location after the scheduled closing time for receipt of bids shall be returned to the bidder unopened.

2. **Bid Security.** Each bid must be accompanied by one of the following forms of bidder's security: (1) cash; (2) a cashier's check made payable to the District; (3) a certified check made payable to the District; or (4) a bidder's bond executed by a California admitted surety as defined in Code of Civil Procedure section 995.120, made payable to the District, in the form set forth in the Contract Documents. Such bidder's security must be in an amount not less than ten percent (10%) of the maximum amount of such bidder's bid as a guarantee that the bidder will enter into the Contract, if the same is awarded to such bidder, and will provide the required Performance and Payment Bonds, insurance certificates and any other required documents. In the event that a bidder is awarded the Contract and such bidder fails to enter into said Contract or provide the surety bond or bonds within five (5) calendar days after award of the Contract to bidder, said security will be forfeited.

3. **Signature.** The bid form, all bonds, all designations of subcontractors, the Contractor's Certificate, the Agreement, and all Guarantees must be signed in permanent blue ink in the name of the bidder and must bear the signature in longhand of the person or persons duly authorized to sign the bid.

If bidder is a corporation, the legal name of the corporation shall first be set forth, together with two signatures: one from the President and one from the Secretary or Assistant Secretary. Alternatively, the signature of other authorized officers or agents may be affixed, if a certified copy of the resolution of the corporate board of directors authorizing them to do so is provided to the District. Such documents shall include the title of such signatories below the signature and shall bear the corporate seal.

If bidder is a partnership, the true name of the firm shall first be set forth, together with the names of all persons comprising the partnership or co-partnership. The bid must be signed by all partners comprising the partnership unless proof in the form of a certified copy of a statement of partnership acknowledging the signer to be a general partner is presented to the District, in which case the general partner may sign.

Bids submitted as joint ventures must so state and be signed by each joint venturer.

Bids submitted by individuals must be signed by the bidder unless an up to date power-of-attorney is on file in the District office, in which case, said person may sign for the individual.

The above rules also apply in the case of the use of a fictitious firm name. In addition, however, where a fictitious name is used, it must be so indicated in the signature.

4. Modifications. 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 District's rejection of the bid as not being responsive to the Notice Inviting Bids. **No oral or telephonic modification of any bid submitted will be considered.**

5. Erasures, Inconsistent or Illegible Bids. The bid submitted must not contain any erasures, interlineations, or other corrections unless each such correction creates no inconsistency and is suitably authenticated by affixing in the margin immediately opposite the correction the signature or signatures of the person or persons signing the bid. In the event of inconsistency between words and figures in the bid price, words shall control figures. In the event that the District determines that any bid is unintelligible, inconsistent, or ambiguous, the District may reject such bid as not being responsive to the Notice Inviting Bids.

6. Examination of Site and Contract Documents. Each bidder shall visit the site of the proposed work and become fully acquainted with the conditions relating to the construction and labor so that the facilities, difficulties, and restrictions attending the execution of the work under the Contract are fully understood. Bidders shall thoroughly examine and be familiar with the drawings and specifications and all other documents and requirements that are attached to and/or contained in the Project Manual or other documents issued to bidders. The failure or omission of any bidder to receive or examine any Contract Documents, form, instrument, addendum, or other document or to visit the site and become acquainted with conditions there existing shall not relieve any bidder from obligations with respect to the bid or to the contract. The submission of a bid shall be taken as prima facie evidence of compliance with this Section. Bidders shall not, at any time after submission of the bid, dispute, complain, or assert that there were any misunderstandings with regard to the nature or amount of work to be done.

7. Withdrawal of Bids. Any bid may be withdrawn, either personally or by written request, at any time prior to the scheduled closing time for receipt of bids. The bid security for bids withdrawn prior to the scheduled closing time for receipt of bids, in accordance with this paragraph, shall be returned upon demand therefor.

No bidder may withdraw any bid for a period of ninety (90) calendar days after the date set for the opening of bids.

8. Agreements, Insurance and Bonds. The Agreement form which the successful bidder, as Contractor, will be required to execute, and the forms and amounts of surety bonds and insurance endorsements which Contractor will be required to be furnished at the time of execution of the Agreement, are included in the bid documents and should be carefully examined by the bidder. The number of executed copies of the Agreement, the Performance Bond, and the Payment Bond required is three (3). Payment and Performance bonds must be executed by an admitted surety insurer as defined in Code of Civil Procedure 995.120.

9. Interpretation of Plans and Documents/Pre-Bid Clarification. If any prospective bidder is in doubt as to the true meaning of any part of the Contract Documents, or finds discrepancies in, or omissions, a written request for an interpretation or correction thereof may be submitted to the District. The bidder submitting the request shall be responsible for its prompt delivery. **Any interpretation or correction of the Contract Documents will only be made by Addendum duly issued, and a copy of such Addendum will be made available for each contractor receiving a set of the Contract Documents.** No person is authorized to make any oral interpretation of any provision in the Contract Documents, nor shall any oral interpretation be binding on the District. If discrepancies on drawings, specifications or elsewhere in the Contract Documents are not covered by addenda, bidder shall include in their bid methods of construction

and materials for the higher quality and complete assembly. Each request for clarification shall be submitted in writing, via email, to only the following persons:

TO: **Juan M. Gonzalez, Gonzalez Architects**
juang@gonzalez-architecture.com

CC: **Rachel Knod, Gonzalez Architects**
rachelk@gonzalez-architecture.com

Each transmitted request shall contain the name of the person and/or firm filing the request, address, telephone, and fax number, Specifications and/or Drawing number. Bidder is responsible for the legibility of hand written requests. Pre-bid clarification request shall be filed a minimum of **six (6)** days prior to bid opening. Requests received less than **six (6)** days before bid opening shall not be considered or responded to. A written response to timely pre-bid clarifications requests which materially affects the bidders price will be made by Addendum issued by the District not less than seventy-two (72) hours prior to bid opening.

10. Bidders Interested in More Than One Bid. No person, firm, or corporation shall be allowed to make, or file, or be interested in more than one prime bid for the same work unless alternate bids are specifically called for. A person, firm, or corporation that has submitted a proposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a proposal or quoting prices to other bidders or making a prime proposal.

11. Award of Contract. The Contract will be awarded to the lowest responsive responsible bidder by action of the governing Board. The District reserves the right to reject any or all bids, or to waive any irregularities or informalities in any bids or in the bidding. In the event an award is made to bidder, and such bidder fails or refuses to execute the Contract and provide the required documents within five (5) calendar days after award of the Contract to bidder, the District may award the Contract to the next lowest responsible and responsive bidder or release all bidders. **Each bid must conform and be responsive to the Contract Documents as defined in the General Conditions.**

12. Bid Protest Procedure. Any bidder may file a bid protest. The protest shall be filed in writing with the District's **Julie DeWall, Assistant Supt. Admin Services** not more than five (5) business days after the date of the bid opening. An e-mail address shall be provided and by filing the protest, protesting bidder consents to receipt of e-mail notices for purposes of the protest and protest related questions and protest appeal, if applicable. The protest shall specify the reasons and facts upon which the protest is based.

a. Resolution of Bid Controversy: Once the bid protest is received, the apparent lowest responsible bidder will be notified of the protest and the evidence presented. If appropriate, the apparent low bidder will be given an opportunity to rebut the evidence and present evidence that the apparent low bidder should be allowed to perform the Work. If deemed appropriate by the District, an informal hearing will be held. District will issue a written decision within fifteen (15) calendar days of receipt of the protest, unless factors beyond the District's reasonable control prevent such resolution. The decision on the bid protest will be copied to all parties involved in the protest.

b. Appeal: If the protesting bidder or the apparent low bidder is not satisfied with the decision, the matter may be appealed to **Doug Collins, District Superintendent** or their designee, within three (3) business days after receipt of the District's written decision on the bid protest. The appeal must be in writing and sent via overnight registered mail with all accompanying information relied upon for the appeal and an e-mail address from which questions and responses may be provided to:

**Chowchilla Elementary School District
Business Department
355 N. 5th Street
Chowchilla, CA 93600**

c. Appeal Review: **Doug Collins, District Superintendent** or their designee shall review the decision on the bid protest from **Julie DeWall, Assistant Supt. Admin Services** and issue a written response to the appeal, or if appropriate, appoint a Hearing Office to conduct a hearing and issue a written decision. The written decision of **Doug Collins, District Superintendent** or the Hearing Officer shall be rendered within fifteen (15) calendar days and shall state the basis for the decision. The decision concerning the appeal will be final and not subject to any further appeals.

d. Reservation of Rights to Proceed with Project Pending Appeal. The District reserves the right to proceed to award the Project and commence construction pending an Appeal. If there is State Funding or a critical completion deadline, the District may choose to shorten the time limits set forth in this Section if written notice is provided to the protesting party. E-mailed notice with a written confirmation sent by First Class Mail shall be sufficient to constitute written notice. If there is no written response to a written notice shortening time, the District may proceed with the award.

e. Finality. Failure to comply with this Bid Protest Procedure shall constitute a waiver of the right to protest and shall constitute a failure to exhaust the protesting bidder's administrative remedies.

13. Alternates. If alternate bids are called for, the Contract may be awarded at the election of the Governing Board to the lowest responsible and responsive bidder using the method and procedures outlined in the Notice Inviting Bids and as specified in the section entitled Alternate/Deductive Bid Alternates.

a. Subcontractor Listing for Alternates. If alternate bids are called for and the bidder intends to use different or additional subcontractors, a separate list of subcontractors must be submitted for each such alternate.

14. Evidence of Responsibility. Upon the request of the District, a bidder whose bid is under consideration for the award of the Contract shall submit promptly to the District satisfactory evidence showing the bidder's financial resources, surety and insurance claims experience, construction experience, completion ability, workload, organization available for the performance of the Contract, and other factors pertinent to a Project of the scope and complexity involved.

15. Listing Subcontractors. Each bidder shall submit with his bid, on the form furnished with the Contract Documents, a list of the names, license numbers, scopes of work, locations of the places of business, contact information, and Department of Industrial Relations ("DIR") registration numbers of each subcontractor who will perform work or labor or render service to the bidder in or about the project, or a subcontractor who under subcontract to the bidder, specially fabricates and installs a portion of the work, in an amount in excess of one-half of 1 percent of the bidder's total bid as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code section 4100, et seq.) Pursuant to Labor Code section 1725.5, all subcontractors (of any tier) performing work on this Project must be properly registered with DIR.

16. Workers' Compensation. In accordance with the provisions of Labor Code section 3700, the successful bidder as the Contractor shall secure payment of compensation to all employees. The Contractor shall sign and file with the District the following certificate prior to performing the work under this contract: "I am aware of the provisions of Section 3700 of the Labor Code, which requires 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.” The form of such certificate is included as a part of the Bid Documents.

17. Contractor’s License. To perform the work required by this notice, the Contractor must possess the Contractor’s License as specified in the Notice Inviting Bids, and the Contractor must maintain the license throughout the duration of the contract. If, at the time of bid, bidder is not licensed to perform the Project in accordance with Division 3, Chapter 9, of the Business and Professions Code for the State of California and the Notice to Contractors calling for bids, such bid will not be considered and the Contractor will forfeit its bid security to the District.

18. Anti-Discrimination. It is the policy of the District that in connection with all work performed under contracts, there be no discrimination against any prospective or active employee engaged in the work because of race, color, ancestry, national origin, religious creed, sex, age, or marital status. The Contractor agrees to comply with applicable federal and California laws, including, but not limited to, the California Fair Employment and Housing Act, beginning with Government Code section 12900 and Labor Code section 1735. In addition, the Contractor agrees to require like compliance by any subcontractors employed on the work by such Contractor.

19. Preference for Materials and Substitutions.

a. One Product Specified. Unless the Plans and Specifications state that no Substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, construction, or any specific name, make, trade name, or catalog number, with or without the words, “or equal,” such specification shall be read as if the language “or equal” is incorporated.

b. Request for Substitution. Bidder may, unless otherwise stated, offer any material, process, article, etc., which is materially equal or better in every respect to that so indicated or specified (“Specified Item”) and will completely accomplish the purpose of the Contract Document. If bidder desires to offer a Substitution for a Specified Item, such bidder must make a request in writing on the District’s Substitution Request Form (“Request Form”) and submit the completed Request Form with the bidder’s bid. The Request Form must be accompanied by evidence as to whether the proposed substitution:

- 1) Is equal in quality, service, and ability to the Specified Item as demonstrated by a side by side comparison of key characteristics and performance criteria (CSI comparison chart);
- 2) Will entail no changes in detail, construction and scheduling of related work;
- 3) Will be acceptable in consideration of the required design and artistic effect;
- 4) Will provide no cost disadvantage to the District;
- 5) Will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts; and
- 6) Will require no change in the Contract Time.

In completing the Request Form, bidder must state with respect to each requested substitution whether bidder will agree to provide the Specified Item in the event that the District denies bidder’s request for substitution of a Specified Item. In the event that bidder does not agree in the Request Form to provide the Specified Item and the District denies the requested Substitution, the bidder’s bid shall be considered non-responsive and the District may award the Contract to the next lowest bidder or in its sole discretion, release all bidders. In the event that bidder has agreed in the Request Form to provide the Specified Item and the District denies bidder’s requested substitution for a Specified Item, bidder shall

execute the Agreement and provide the Specified Item without any additional cost or charge to the District, and if bidder fails to execute the Agreement with the Specified Item(s), bidder's bid bond will be forfeited.

After the bids are opened, the apparent lowest bidder shall provide, within five (5) calendar days of opening such bids, any and all Drawings, Specifications, samples, performance data, calculations, and other information as may be required to assist the Architect and the District in determining whether the proposed substitution is acceptable. The burden of establishing these facts shall be upon the bidder.

After the District's receipt of such evidence by bidder, the District will make its final decision as to whether the bidder's request for Substitution for any Specified Items will be granted. The District shall have sole discretion in deciding as to whether a proposed request for Substitution is equal to or better than a Specified Item. Any request for Substitution which is granted by the District shall be documented and processed through a Change Order. The District may condition its approval of any Substitution upon delivery to the District of an extended warranty or other assurances of adequate performance of the Substitution. Any and all risks of delay due to DSA, or any other governmental agency having jurisdiction shall be on the bidder.

20. Disqualification of Bidders and Proposals. More than one proposal for the same work from any individual, firm, partnership, corporation, or association under the same or different names will not be accepted; and reasonable grounds for believing that any bidder is interested in more than one proposal for the work will be cause for rejecting all proposals in which such bidder is interested and the bidder will forfeit their bid security to the District.

21. Unbalanced or Altered Bids. Proposals in which the prices are obviously unbalanced, and those which are incomplete or show any alteration of form, or contain any additions or conditional or alternate bids that are not called for or otherwise permitted, may be rejected. A proposal on which the signature of the bidder has been omitted may be rejected. If, in the District's sole discretion, it determines any pricing, costs or other information submitted by a bidder may result in an unbalanced bid, the District may deem such bid non-responsive. A bid may be determined by the District to be unbalanced if the bid is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the District even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advanced payment.

22. Employment of Apprentices. The Contractor and all Subcontractors shall comply with the provisions of California Labor Code including, but not limited to sections 1777.5, 1777.6, and 1777.7 concerning the employment of apprentices. The Contractor and any Subcontractor under him shall comply with the requirements of said sections, including applicable portions of all subsequent amendments in the employment of apprentices; however, the Contractor shall have full responsibility for compliance with said Labor Code sections, for all apprenticeable occupations, regardless of any other contractual or employment relationships alleged to exist.

23. Non-Collusion Declaration. Public Contract Code section 7106 requires bidders to submit declaration of non-collusion with their bids. This form is included with the bid documents and must be signed and dated by the bidder under penalty of perjury.

24. Wage Rates, Travel and Subsistence.

a. The Contractor and all subcontractors shall comply with the requirements set forth in Division 2, Part 7, Chapter 1 of the Labor Code. Pursuant to Labor Code section 1770 et seq., the District

has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this work is to be performed for each craft, classification or type of worker needed to execute the contract. Copies are available from the District to any interested party on request and are also available from the Director of the Department of Industrial Relations. The Contractor shall obtain copies of the above-referenced prevailing wage sheets and post a copy of such wage rates at appropriate, conspicuous, weatherproof points at the Site.

b. Any worker employed to perform work on the Project and 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.

c. 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.

d. These per diem rates, including holiday and overtime work, and employer payments for health and welfare, pension, vacation, and similar purposes, are on file at the administrative office of the District, located as noted above and are also available from the Director of the Department of Industrial Relations. It is the Contractor's responsibility to ensure the appropriate prevailing rates of per diem wages are paid for each classification. It shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractor under such Contractor, to pay not less than the said specified rates to all workers employed by them in the execution of the Contract.

25. DIR Registration of Contractor and Subcontractors. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

This Project is a public works project as defined in Labor Code section 1720. Each contractor bidding on this Project and all subcontractors (of any tier) performing any portion of the Work must comply with the Labor Code sections 1725.5 and 1771.1 and must be properly and currently registered with DIR and qualified to perform public works pursuant to Labor Code section 1725.5 throughout the duration of the Project. For more information and up to date requirements, contractors are recommended to periodically review the DI's website at www.dir.ca.gov. Contractor shall be solely responsible for ensuring compliance with Labor Code section 1725.5 as well as any requirements implemented by DIR applicable to its services or its subcontractors throughout the term of the Agreement and in no event shall contractor be granted increased payment from the District or any time extensions to complete the Project as a result of contractor's efforts to maintain compliance with the Labor Code or any requirements implemented by the DIR. Failure to comply with these requirements shall be deemed a material breach of this Agreement and grounds for termination for cause. The contractor and all subcontractors shall furnish certified payroll records as required pursuant Labor Code section 1776 directly to the Labor Commissioner in accordance with Labor Code section 1771.4 on at least 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. The District reserves the

right to withhold contract payments if the District is notified, or determines as the result of its own investigation, that contractor is in violation of any of the requirements set forth in Labor Code section 1720 et seq. at no penalty or cost to the District. Monitoring and enforcement of the prevailing wage laws and related requirements will be performed by the Labor Commissioner/ Department of Labor Standards Enforcement (DLSE).

26. No Telephone or Facsimile Availability. No telephone or facsimile machine will be available to bidders on the District premises at any time.

27. Obtaining Bidding Documents. Bidding Documents, may be obtained as noted in Notice Inviting Bids.

Bidder shall utilize a complete set of Bidding Documents in preparing a bid. The failure or omission of bidder to receive any Bidding Document, form, instrument, Addendum, or other document shall not relieve bidder from any obligations with respect to the bid and/or Contract.

28. Addenda. Clarification or any other notice of a change in the Bidding Documents will be issued only by the District and only in the form of a written Addendum, transmitted by fax, e-mail, or available for pick up to all who are known by the issuing office to have received a complete set of Bidding Documents. Any other purported Addenda are void and unenforceable.

Bidder is responsible for ascertaining the disposition of all Addenda issued regardless of District notification and to acknowledge all Addenda in the submitted sealed bid prior to the bid opening. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for inspection. Each Addendum will be numbered, dated, and identified with the Project number. Oral statements or any instructions in any form, other than Addendum as described above, shall be void and unenforceable. Addenda issued by the District and not noted as being acknowledged by bidder as required in the Bid Form, may result in the bid being deemed non-responsive.

29. Debarment. Bidder may also be subject to debarment, in addition to seeking remedies for False Claims under Government Code section 12650 et seq. and Penal Code section 72, the District may debar a Contractor pursuant to Article 15 of the General Conditions if the Board, or the Board may designate a hearing officer who, in his or her discretion, finds the Contractor has done any of the following:

- a. Intentionally or with reckless disregard, violated any term of a contract with the District
- b. Committed an act or omission which reflects on the Contractor's quality, fitness or capacity to perform work for the District;
- c. Committed an act or offense which indicates a lack of business integrity or business honesty; or,
- d. Made or submitted a false claim against the District or any other public entity (See Government Code section 12650, et seq., and Penal Code section 72)

CHECKLIST OF MANDATORY BID FORMS

(For Contractor's use and reference only. Additional documents may be required so bidders should carefully review all Contract Documents and Bid Documents)

Designation of Subcontractors

Bid Form

Contractor's Certificate Regarding Workers Compensation

Non-Collusion Declaration

Bid Bond (or Bid Guarantee form if Security is other than Bid Bond)

Substitution Request Form (If Substitution Request Form is not submitted then NO Substitutions will be allowed after the bids are opened)

Acknowledgment of Bidding Practices Regarding Indemnity

DVBE Participation Statement

Contractor's Certificate Regarding Drug-Free Work Place

PRE-BID CLARIFICATION FORM (For Contractor's Use)

PROJECT NAME:	MULTI-PURPOSE BUILDING AT FAIRMEAD E.S.		
PROJECT NUMBER:	-		
TO:	Juan M. Gonzalez, Architect	EMAIL:	juang@gonzalez-architecture.com

DATE:			
FROM:		EMAIL:	
DOCUMENT/DIVISION NUMBER:		DRAWING NUMBER:	

REQUESTED CLARIFICATION:

RESPONSE TO CLARIFICATION:

Attach additional numbered sheets as necessary; however, only one (1) request shall be contained on each submitted form.

DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act (California Public Contract Code section 4100 et seq.,) and any amendments thereof, each Bidder shall set forth below: (a) the name, license number, and location of the place of business of each subcontractor who will perform work or labor or render service to the Contractor, who will perform work or labor or work or improvement to be performed under this Contract, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvements according to detailed Drawings contained in the Plans and Specifications in an amount in excess of one-half of one percent of the Contractor's total bid; and (b) the portion and description of the work which will be done by each subcontractor under this Act. The Contractor shall list only one subcontractor for each such portion as is defined by the Contractor in this bid. All subcontractors shall be properly licensed by the California State Licensing Board.

If a Contractor fails to specify a subcontractor, or if a Contractor specifies more than one subcontractor for the same portion of work to be performed under the Contract in excess of one-half of one percent of the Contractor's total bid, the Contractor shall be deemed to have agreed that the Contractor is fully qualified to perform that portion, and that the Contractor alone shall perform that portion.

No Contractor whose bid is accepted shall (a) substitute any subcontractor, (b) permit any subcontractor to be voluntarily assigned or transferred or allow the relevant portion of the work 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 of one percent of the Contractor's total bid where 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 of one percent of the Contractor's total bid where no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then 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.

All subcontractors (of any tier) performing any portion of the Work must comply with the Labor Code sections 1725.5 and 1771.1 and must be properly and currently registered with the California Department of Industrial Relations and qualified to perform public works pursuant to Labor Code section 1725.5 throughout the duration of the Project.

NOTE: If alternate bids are called for and bidder intends to use different or additional subcontractors on the alternates, a separate list of subcontractors must be provided for each such Alternate.

DESIGNATION OF SUBCONTRACTORS FORM

Scope of Work	Name of Subcontractor	Location & Place of Business	License Type and Number	DIR Registration Number	<i>E-Mail & Telephone*</i>

Scope of Work	Name of Subcontractor	Location & Place of Business	License Type and Number	DIR Registration Number	E-Mail & Telephone*

* This information must be provided at the time of submission of bid or must be provided within 24 hours after the time set for the opening of bids. Bidders who choose to provide this information within 24 hours after the time set for the opening of bids are solely responsible to ensure the District receives this information in a timely manner. The District is not responsible for any problems or delays associated with emails, faxes, delivery, etc. Absent a verified fax or email receipt date and time by the District, the District's determination of whether the information was received timely shall govern and be determinative. Bidder shall not revise or amend any other information in this form submitted at the time of bid. The information submitted at the time of bid shall govern over any conflicts, discrepancies, ambiguities or other differences in any subsequent Subcontractor Designation Forms submitted by the bidder

Proper Name of Bidder:

Date:

Name:

Signature of Bidder
Representative:

Address:

Phone:

BID FORM
FOR
MULTI-PURPOSE BUILDING
AT
FAIRMEAD ELEMENTARY SCHOOL

FOR
CHOWCHILLA ELEMENTARY SCHOOL DISTRICT

CONTRACTOR
NAME:

ADDRESS:

TELEPHONE:

()

FAX:

()

EMAIL

TO: Chowchilla Elementary School District, acting by and through its Governing Board, herein called "District".

1. Pursuant to and in compliance with your Notice Inviting Bids and other documents relating thereto, the undersigned bidder, having familiarized himself with the terms of the Contract, the local conditions affecting the performance of the Contract, the cost of the work at the place where the work is to be done, with the Drawings and Specifications, and other Contract Documents, hereby proposes and agrees to perform within the time stipulated, the Contract, including all of its component parts, and everything required to be performed, including its acceptance by the District, and to provide and furnish any and all labor, materials, tools, expendable equipment, and utility and transportation services necessary to perform the Contract and complete all of the Work in a workmanlike manner required in connection with the construction of:

MULTI-PURPOSE BULDING AT FAIRMEAD E.S.

in the District described above, all in strict conformance with the drawings and other Contract Documents on file at the Purchasing Office of said District for amounts set forth herein.

2. BIDDER ACKNOWLEDGES THE FOLLOWING ADDENDUM:

Number Number Number Number Number Number Number Number

Acknowledge the inclusion of all addenda issued prior to bid in the blanks provided above. Your failure to do so may render your bid non-responsive.

3. BASE BID TOTAL CASH PURCHASE PRICE IN WORDS & NUMBERS:

_____ DOLLARS
(\$ _____)

4. ALTERNATE BIDS: The following amounts shall be added to or deducted from the Base Bid at the District's option. Alternates are fully described in the Specifications.

Alternate No. 1: DEDUCT _____ Dollars (\$_____)

5. TIME FOR COMPLETION: The District may give a notice to proceed within ninety (90) days of the award of the bid by the District. Once the Contractor has received the notice to proceed, the Contractor shall complete the work in the time specified in the Agreement. By submitting this bid, Contractor has thoroughly studied this Project and agrees that the Contract Time for this Project is adequate for the timely and proper completion of the Project. Further, Contractor has included in the analysis of the time required for this Project, Rain Days, Governmental Delays, and the requisite time to complete Punch List.

In the event that the District desires to postpone giving the notice to proceed beyond this ninety (90) day period, it is expressly understood that with reasonable notice to the Contractor, giving the notice to proceed may be postponed by the District. It is further expressly understood by the

Contractor, that the Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of giving the notice to proceed.

If the Contractor believes that a postponement will cause a hardship to it, the Contractor may terminate the contract with written notice to the District within ten (10) days after receipt by the Contractor of the District's notice of postponement. Should the Contractor terminate the Contract as a result of a notice of postponement, the District shall have the authority to award the Contract to the next lowest responsible bidder, if applicable.

It is understood that the District reserves the right to reject any or all bids and/or waive any irregularities or informalities in this bid or in the bid process. The Contractor understands that it may not withdraw this bid for a period of ninety (90) days after the date set for the opening of bids.

6. Attached is bid security in the amount of not less than ten percent (10%) of the bid:

Bid bond (10% of the Bid), certified check, or cashier's check (circle one)

7. The required List of Designated Subcontractors is attached hereto.

8. The required Non-Collusion Declaration is attached hereto.

9. The Substitution Request Form, if applicable, is attached hereto.

10. It is understood and agreed that if written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the undersigned after the opening of the bid, and within the time this bid is required to remain open, or at any time thereafter before this bid is withdrawn, the undersigned will execute and deliver to the District a Contract in the form attached hereto in accordance with the bid as accepted, and that he or she will also furnish and deliver to the District the Performance Bond and Payment Bond, all within five (5) calendar days after award of Contract, and that the work under the Contract shall be commenced by the undersigned bidder, if awarded the Contract, by the start date provided in the District's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents.

11. The names of all persons interested in the foregoing proposal as principals are as follows:

(IMPORTANT NOTICE: If bidder or other interested person is a corporation, state the legal name of such corporation, as well as the names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state the true names of the firm, as well as the names of all individual co-partners comprising the firm; if bidder or other interested person is an individual, state the first and last names in full.)

12. PROTEST PROCEDURES. If there is a bid protest, the grounds shall be submitted as set forth in the Instructions to Bidders.

13. The undersigned bidder shall be licensed and shall provide the following California Contractor's license information:

License Number: _____
License Expiration Date: _____
Name on License: _____
Class of License: _____
DIR Registration Number: _____

If the bidder is a joint venture, each member of the joint venture must include the above information.

14. Time is of the essence regarding this Contract, therefore, in the event the bidder to whom the Contract is awarded fails or refuses to post the required bonds and return executed copies of the Agreement form within five (5) calendar days from the date of receiving the Notice of Award, the District may declare the bidder's bid deposit or bond forfeited as damages.

15. The bidder declares that he/she has carefully examined the location of the proposed Project, that he/she has examined the Contract Documents, including the Plans, General Conditions, Supplemental Conditions, Addenda, and Specifications, all others documents and requirements that are attached to and/or contained in the Project Manual, all other documents issued to bidders and read the accompanying instructions to bidders, and hereby proposes and agrees, if this proposal is accepted, to furnish all materials and do all work required to complete the said work in accordance with the Contract Documents, in the time and manner therein prescribed for the unit cost and lump sum amounts set forth in this Bid Form.

16. DEBARMENT. In addition to seeking remedies for False Claims under Government Code section 12650 et seq. and Penal Code section 72, the District may debar a Contractor pursuant to Article 15 of the General Conditions if the Board, or the Board may designate a hearing officer who, in his or her discretion, finds the Contractor has done any of the following:

- a. Intentionally or with reckless disregard, violated any term of a contract with the District;
- b. Committed an act or omission which reflects on the Contractor's quality, fitness or capacity to perform work for the District;
- c. Committed an act or offense which indicates a lack of business integrity or business honesty; or
- d. Made or submitted a false claim against the District or any other public entity. (See Government Code section 12650, et seq., and Penal Code section 72)

17. DESIGNATION OF SUBCONTRACTORS. In compliance with the Subletting and Subcontracting Fair Practices Act (California Public Contract Code section 4100 et seq.) and any amendments thereof, each bidder shall list subcontractors on the District's form Subcontractor list. This subcontractor list shall be submitted with the bid and is a required form

I agree to receive service of notices at the e-mail address listed below.

I the below-indicated bidder, declare under penalty of perjury that the information provided and representations made in this bid are true and correct.

Proper Name of Company

Name of Bidder Representative

Street Address

City, State, and Zip

()
Phone Number

()
Fax Number

E-Mail

By: _____ Date: _____
Signature of Bidder Representative

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his signature shall be placed above.

All signatures must be made in permanent blue ink.

CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION
FORM

Labor Code section 3700 in relevant part provides:

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

1. By being insured against liability to pay compensation by one or more insurers duly authorized to write compensation insurance in this State.
2. By securing from the Director of Industrial Relations a certificate of consent to self-insure, which 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 employees.
3. For any county, city, city and county, municipal corporation, public district, public agency, or any political subdivision of the state, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the state itself), by securing from the Director of Industrial Relations a certificate of consent to self-insure against workers' compensation claims, which certificate may be given upon furnishing proof satisfactory to the director of ability to administer workers' compensation claims properly, and to pay workers' compensation claims that may become due to its employees. On or before March 31, 1979, a political subdivision of the state which, on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers' compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702.

I am aware of the provisions of 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 provision before commencing the performance of the work of this Contract.

(Signature)

(Print)

(Date)

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 submitted with the Contractor's bid.

NON-COLLUSION DECLARATION

The undersigned declares:

I am the _____ [Title] of _____ [Name of Company], the party making the foregoing bid.

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 _____ [Date], at _____ [City], _____ [State].

Signed: _____

Typed Name: _____

BID GUARANTEE FORM

(Use only when not using a Bid Bond)

Accompanying this proposal is a cashier's check payable to the order of the Chowchilla Elementary School District or a certified check payable to the order of the Chowchilla Elementary School District in an amount equal to ten percent (10%) of the base bid and alternates (\$_____).

The proceeds of this check shall become the property of said District, if, this proposal shall be accepted by the District through the District's Governing Board, and the undersigned fails to execute a Contract with and furnish the sureties required by the District within the required time; otherwise, said check is to be returned to the undersigned.

Bidder

Note: Use this form, in lieu of Bid Bond form, when a cashier's check or certified check is accompanying the bid

BID BOND FORM

KNOW ALL MEN BY THESE PRESENT that we, the undersigned, (hereafter called "Principal"), and _____ (hereafter called "Surety"), are hereby held and firmly bound unto the Chowchilla Elementary School District (hereafter called "District") in the sum of _____ (\$_____) for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors, and assigns.

SIGNED this _____ day of _____, 20__.

The condition of the above obligation is such that whereas the Principal has submitted to the District a certain Bid, attached hereto and hereby made a part hereof, to enter into a Contract in _____ writing _____ for _____ the _____ construction _____ of _____.

NOW, THEREFORE,

- a. If said Bid is rejected, or
- b. If said Bid is accepted and the Principal executes and delivers a Contract or the attached Agreement form within five (5) calendar days after acceptance (properly completed in accordance with said Bid), and furnishes bonds for his faithful performance of said Contract and for payment of all persons performing labor or furnishing materials in connection therewith,

Then this obligation shall be void; otherwise, the same shall remain in force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the call for bids, or the work to be performed thereunder, or the specifications accompanying the same, shall in anyway affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of said Contract, or the call for bids, or the work, or to the specifications.

In the event suit is brought upon this bond by the District and judgment is recovered, the Surety shall pay all costs incurred by the District in such suit, including without limitation, attorneys' fees to be fixed by the court.

IN WITNESS WHEREOF, Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year first set forth above.

(Corporate Seal)

By _____
Principal's Signature

Typed or Printed Name

Principal's Title

(Corporate Seal)

By _____
Surety's Signature

Typed or Printed Name

Title

(Attached Attorney in Fact Certificate)

Surety's Name

Surety's Address

Surety's Phone Number

IMPORTANT:

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code section 105, and if the work or project is financed, in whole or in part, with federal, grant, or loan funds, it must also appear on the Treasury Department's most current list (Circular 570 as amended).

THIS IS A REQUIRED FORM.

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of agent or representative for service of process in California if different from above)

(Telephone Number of Surety and agent or representative for service of process in California).

REQUEST FOR SUBSTITUTION AT TIME OF BID

Pursuant to Public Contract Code section 3400, bidder submits the following request to Substitute with the bid that is submitted. I understand that if the request to substitute is not “an/or equal” or is not accepted by District and I answer “no” I will not provide the specified item, then I will be held non-responsive and my bid will be rejected. With this understanding, I hereby request Substitution of the following articles, devices, equipment, products, materials, fixtures, patented processes, forms, methods, or types of construction:

	Specification Section	Specified Item	Requested Substituted Item	Contractor Agrees to Provide Specified Item if request to Substitute is Denied ¹ (circle one)	District Decision (circle one)
1.				Yes No	Grant Deny
2.				Yes No	Grant Deny
3.				Yes No	Grant Deny
4.				Yes No	Grant Deny
5.				Yes No	Grant Deny
6.				Yes No	Grant Deny
7.				Yes No	Grant Deny
8.				Yes No	Grant Deny
9.				Yes No	Grant Deny
10.				Yes No	Grant Deny
11.				Yes No	Grant Deny
12.				Yes No	Grant Deny

This Request Form must be accompanied by evidence as to whether the proposed Substitution (1) is equal in quality, service, and ability to the Specified Item; (2) will entail no change in detail, construction, and scheduling of related work; (3) will be acceptable in consideration of the required design and artistic effect; (4) will provide no cost disadvantage to the District; (5) will require no excessive or more expensive

¹ Bidder must state whether bidder will provide the Specified Item in the event the Substitution request is evaluate and denied. If bidder states that bidder will not provide the Specified Item the denial of a request to Substitute shall result in the rejection of the bidder as non-responsive. However, if bidder states that bidder will provide the Specified Item in the event that bidder’s request for Substitution is denied, bidder shall execute the Agreement and provide the Specified Item(s). If bidder refuses to execute the Agreement due to the District’s decision to require the Specified Item(s) at no additional cost, bidder’s Bid Bond shall be forfeited.

maintenance, including adequacy and availability of replacement parts; (6) will require no change of the construction schedule or milestones for the Project; and, (7) Contractor agrees to pay for any DSA Fees or other Governmental Plan check costs associated with this Substitution Request. (See General Conditions Section 3.6)

The undersigned states that the following paragraphs are correct:

1. The proposed Substitution does not affect the dimensions shown on the Drawings.
2. The undersigned will pay for changes to the building design, including Architect, engineering, or other consultant design, detailing, DSA plan check or other governmental plan check costs, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the Contract Time, or specified warranty requirements.
4. Maintenance and service parts will be available locally for the proposed substitution.
5. In order for the Architect to properly review the substitution request, within five (5) days following the opening of bids, the Contractor shall provide samples, test criteria, manufacturer information, and any other documents requested by Architect or Architect's engineers or consultants, including the submissions that would ordinarily be required under Article 3.7 for Shop Drawings along with a document which provides a side by side comparison of key characteristics and performance criteria (often known as a CSI side by side comparison chart).
6. If Substitution Request is accepted by the District, Contractor is still required to provide a Submittal for the substituted item pursuant to Article 3.7 and shall provide required Schedule information (including schedule fragments, if applicable) for the substituted item as required under Article 8.3.2.1. The approval of the Architect, Engineer, or District of the substitution request does not mean that the Contractor is relieved of Contractor's responsibilities for Submittals, Shop Drawings, and schedules under Article 3.7 and 8.3.2 if the Contractor is awarded the Project.

Name of Bidder: _____

By: _____

District: _____

By: _____

ACKNOWLEDGMENT OF BIDDING PRACTICES REGARDING INDEMNITY FORM

TO: Chowchilla Elementary School District

RE: Project Number _____

Construction Contract for _____

Please be advised that with respect to the above-referenced Project the undersigned Contractor on behalf of itself and all subcontractors hereby waives the benefits and protection of Labor Code section 3864, which provides:

“If an action as provided in this chapter is prosecuted by the employee, the employer, or both jointly against the third person results in judgment against such third person, the employer shall have no liability to reimburse or hold such third person harmless on such judgment or settlement in the absence of a written agreement to do so executed prior to the injury.”

This Agreement has been signed by an authorized representative of the contracting party and shall be binding upon its successors and assignees. The undersigned further agrees to promptly notify the District of any changes of ownership of the contracting party or any subcontractor while this Agreement is in force.

Contracting Party

Name of Agent/Title

DISABLED VETERAN BUSINESS ENTERPRISE (DVBE) PARTICIPATION
STATEMENT

Each bidder must complete this form in order to comply with the Chowchilla Elementary School District ("District") policy for participation of disabled veteran business enterprises.

Project Name: _____

Bid No.: _____

DSA No.: _____

The undersigned, on behalf of the Contractor named below, certifies that the Contractor has made reasonable efforts to secure participation by DVBE in the Contract to be awarded for the above-referenced Bid No., including participation by DVBE subcontractors and/or material suppliers. **Check only one of the following:**

The Contractor was unable after reasonable efforts to secure DVBE participation in the Contract for the above-referenced Project/Bid No. However, the Contractor will use DVBE services if the opportunity arises at any time during construction of the Project. Upon completion of the Project, the Contractor will report to the District the total dollar amount of DVBE participation in any Contract awarded to Contractor, and in any change orders, for the above-referenced Project.

The Contractor has secured DVBE participation in the Contract for the above referenced Project/Bid No., and anticipates that such DVBE participation will equal approximately _____dollars (\$_____), which represents approximately _____percent (___%) of the total Contract for such Project. Upon completion of the Project, Contractor will report to the District the actual total dollar amount of DVBE participation in the Contract awarded to Contractor, and in any change orders, for such Project

Company: _____

Name: _____

Title: _____

Signature: _____

Date: _____

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 contract 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 Chowchilla Elementary School District 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

[End of Bid Documents to be Submitted with Bid]

AGREEMENT FORM

THIS AGREEMENT, entered into this ____ day of _____, 20__ in the County of Riverside of the State of California, by and between the Chowchilla Elementary School District, hereinafter called the “District”, and _____, hereinafter called the “Contractor”.

WITNESSETH that the District and the Contractor for the consideration stated herein agree as follows:

ARTICLE 1 - SCOPE OF WORK: The Contractor shall furnish all labor, materials, equipment, tools, and utility and transportation services, and perform and complete all work required in connection with _____ (“Project”) in strict accordance with the Contract Documents enumerated in Article 7 below. The Contractor shall be liable to the District for any damages arising as a result of a failure to comply with that obligation, and the Contractor shall not be excused with respect to any failure to so comply by an act or omission of the Architect, Engineer, Inspector, Division of the State Architect (DSA), or representative of any of them, unless such act or omission actually prevents the Contractor from fully complying with the Contract Documents and the Contractor protests, in accordance with the Contract Documents, that the act or omission is preventing the Contractor from fully complying with the Contract Documents. Such protest shall not be effective unless reduced to writing and filed with the District office within seven (7) days of the date of occurrence of such act or omission preventing the Contractor from fully complying with the Contract Documents.

ARTICLE 2 - TIME OF COMPLETION: The District may give notice to proceed within ninety (90) days of the award of the bid by the District. Once the Contractor has received a notice to proceed, the Contractor shall reach Substantial Completion (See Article 1.1.46) of the Work within _____ (____) calendar days from receipt of the Notice to Proceed. This shall be called Contract Time. (See Article 8.1.1). It is expressly understood that time is of the essence.

Contractor has thoroughly studied the Project and has satisfied itself that the time period for this Project was adequate for the timely and proper completion of the Project within each milestone and within the Contract time. Further, Contractor has included in the analysis of the time required for this Project, items set forth in General Conditions Article 8.3.2.1, Submittal Schedules, Rain Day Float, and Governmental Delay Float.

In the event that the District desires to postpone giving the notice to proceed beyond this ninety (90) day period, it is expressly understood that with reasonable notice to the Contractor, giving the notice to proceed may be postponed by the District. It is further expressly understood by the Contractor, that the Contractor shall not be entitled to any claim of additional compensation as a result of the District’s postponement of giving the notice to proceed.

If the Contractor believes that a postponement will cause hardship to it, the Contractor may terminate the Contract with written notice to the District within ten (10) days after receipt by the Contractor of the District’s notice of postponement. It is further understood by the Contractor that in the event that the Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay the Contractor for the work performed by the Contractor at the time of notification of postponement. Should the Contractor terminate the Contract as a result of a notice of postponement, the District shall have the authority to award the Contract to the next lowest responsible bidder.

ARTICLE 3 - LIQUIDATED DAMAGES: It being impracticable and infeasible to determine the amount of actual damage, it is agreed that the Contractor will pay the District the sum of One Thousand (\$ 1,000) per calendar day for each and every day of delay beyond the Contract Time set forth in Article 2 of this Agreement (inclusive of Milestones that are critical on the critical path or noted as critical to the District) as liquidated damages and not as a penalty or forfeiture. In the event Liquidated Damages are not paid, the Contractor further agrees that the District may deduct such amount thereof from any money due or that may become due the Contractor under the Contract (See Article 9.6 and 2.2 of the General Conditions).

ARTICLE 4 - CONTRACT PRICE: The District shall pay to the Contractor as full consideration for the faithful performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, the sum of _____ DOLLARS (\$ _____), said sum being the total amount stipulated in the Bid Contractor submitted. Payment shall be made as set forth in the General Conditions.

Should any Change Order result in an increase in the Contract Price, the cost of such Change Order shall be agreed to in advance by the Contractor and the District, subject to the monetary limitations set forth in Public Contract Code section 20659. In the event that the Contractor proceeds with a Change in work without an agreement between the District and Contractor regarding the cost of a Change Order, the Contractor waives any Claim of additional compensation for such additional work (See Article 7.2).

ARTICLE 5 - HOLD HARMLESS AGREEMENT: Contractor shall defend, indemnify and hold harmless District, Architect, Inspector, the State of California and their officers, employees, agents and independent contractors from all liabilities, claims, actions, liens, judgments, demands, damages, losses, costs or expenses of any kind arising from death, personal injury, property damage or other cause based or asserted upon any act, omission, or breach connected with or arising from the progress of Work or performance of service under this Agreement or the Contract Documents. As part of this indemnity, Contractor shall protect and defend, at its own expense, District, Architect, Construction Manager, Inspector, the State of California and their officers, employees, agents and independent contractors from any legal action including attorney's fees or other proceeding based upon such act, omission, breach or as otherwise required by this Article.

Furthermore, Contractor agrees to and does hereby defend, indemnify and hold harmless District, Architect, Construction Manager, Inspector, the State of California and their officers, employees, agents and independent contractors from every claim or demand made, and every liability, loss, damage, expense or attorney's fees of any nature whatsoever, which may be incurred by reason of:

(a) Liability for (1) death or bodily injury to persons; (2) damage or injury to, loss (including theft), or loss of use of, any property; (3) any failure or alleged failure to comply with any provision of law or the Contract Documents; or (4) any other loss, damage or expense, sustained by any person, firm or corporation or in connection with the Work called for in this Agreement or the Contract Documents, except for liability resulting from the sole or active negligence, or the willful misconduct of the District.

(b) Any bodily injury to or death of persons or damage to property caused by any act, omission or breach of Contractor or any person, firm or corporation employed by Contractor, either directly or by independent contract, including all damages or injury to or death of persons, loss (including theft) or loss of use of any property, sustained by any person, firm or corporation, including the District, arising out of or in any way connected with Work covered by this Agreement or the Contract Documents, whether said injury or damage occurs either on or off District property, but not for any loss, injury, death or damages caused by the sole or active negligence or willful misconduct of the District.

(c) Any dispute between Contractor and Contractor's subcontractors/suppliers/ Sureties, including, but not limited to, any failure or alleged failure of the Contractor (or any person hired or employed directly or indirectly by the Contractor) to pay any Subcontractor or Materialman of any tier or any other person employed in connection with the Work and/or filing of any stop notice or mechanic's lien claims.

(d) Any claims, allegations, penalties, assessments, or liabilities to the extent caused by the Contractor's failure or the failure of any Subcontractor of any tier, to fully comply with the DIR registration requirements under Labor Code section 1725.5 at all times during the performance of any Work on the Project and shall reimburse the District for any penalties assessed against the District arising from any failure by the Contractor or any Subcontractor of any tier from complying with Labor Code sections 1725.5 and 1771.1. Nothing in this paragraph, however, shall require the Contractor or any Subcontractor to be liable to the District or indemnify the District for any penalties caused by the District in accordance with Labor Code section 1773.3 (g).

Contractor, at its own expense, cost, and risk, shall defend any and all claims, actions, suits, or other proceedings that may be brought or instituted against the District, its officers, agents or employees, on account of or founded upon any cause, damage, or injury identified herein Article 5 and shall pay or satisfy any judgment that may be rendered against the District, its officers, agents or employees in any action, suit or other proceedings as a result thereof.

The Contractor's and Subcontractors' obligation to defend, indemnify and hold harmless the Owner, Architect, Inspector, the State of California and their officers, employees, agents and independent contractors hereunder shall include, without limitation, any and all claims, damages, and costs for the following: (1) any damages or injury to or death of any person, and damage or injury to, loss (including theft), or loss of use of, any property; (2) breach of any warranty, express or implied; (3) failure of the Contractor or Subcontractors to comply with any applicable governmental law, rule, regulation, or other requirement; (4) products installed in or used in connection with the Work; and (5) any claims of violation of the Americans with Disabilities Act ("ADA").

ARTICLE 6 - PROVISIONS REQUIRED BY LAW: Each and every provision of law and clause required to be inserted in this Contract shall be deemed to be inserted herein, and this Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted or is not inserted correctly, then upon application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

ARTICLE 7 - COMPONENT PARTS OF THE CONTRACT: The Contract entered into by this Agreement consists of the following Contract Documents, all of which are component parts of the Contract as if herein set out in full or attached hereto:

Notice Inviting Bids
Instructions to Bidders
Designation of Subcontractors
Non-Collusion Declaration
Bid Guarantee Form
Bid Bond
Bid Form
Contractor's Certificate Regarding Worker's Compensation
Acknowledgment of Bidding Practices Regarding Indemnity

DVBE Participation Statement and Close-Out Forms
Agreement Form
Payment Bond
Performance Bond
Guarantee
Escrow Agreement for Security Deposit In Lieu of Retention
Workers' Compensation/Employers Liability Endorsement
General Liability Endorsement
Automobile Liability Endorsement
Contractor's Certificate Regarding Drug-Free Workplace
General Conditions
Supplementary and Special Conditions
Specifications
All Addenda as Issued
Drawings/Plans
Substitution Request Form
Requirements, Reports and/or Documents in the Project Manual or Other Documents Issued to Bidders

All of the above named Contract Documents are intended to be complementary. Work required by one of the above named Contract Documents and not by others shall be done as if required by all.

ARTICLE 8 - PREVAILING WAGES: Wage rates for this Project shall be in accordance with the general prevailing rate of holiday and overtime work in the locality in which the work is to be performed for each craft, classification, or type of work needed to execute the Contract as determined by the Director of the Department of Industrial Relations. Copies of schedules of rates so determined by the Director of the Department of Industrial Relations are on file at the administrative office of the District and are also available from the Director of the Department of Industrial Relations. 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 following are hereby referenced and made a part of this Agreement and Contractor stipulates to the provisions contained therein.

1. Chapter 1 of Part 7 of Division 2 of the Labor Code (Section 1720 et seq.)
2. California Code of Regulations, Title 8, Chapter 8, Subchapters 3 through 6 (Section 16000 et seq.)

ARTICLE 9 - RECORD AUDIT: In accordance with Government Code section 8546.7 (and Davis Bacon, if applicable) and Article 13.11 of the General Conditions, records of both the District and the Contractor shall be subject to examination and audit for a period of five (5) years after a Final Retention Payment or the Recording of a Notice of Completion, whichever occurs first.

ARTICLE 10 - CONTRACTOR'S LICENSE: The Contractor must possess throughout the Project a Class _____ Contractor's License, issued by the State of California, which must be current and in good standing.

IN WITNESS WHEREOF, this Agreement has been duly executed by the above named parties, on the day and year first above written.

Chowchilla Elementary School District

CONTRACTOR:

By: _____

Typed or Printed Name

By: _____
Purchasing and Contracts Director

Title

Dated: _____

Signature

Type or Printed Name

Title (Authorized Officers or Agents)

Signature

(CORPORATE SEAL)

PAYMENT BOND

(CALIFORNIA PUBLIC WORK)

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, the CHOWCHILLA ELEMENTARY SCHOOL DISTRICT (sometimes referred to hereinafter as "Obligee") has awarded to _____ (hereinafter designated as the "Principal" or "Contractor"), an agreement for the work described as follows: _____ (hereinafter referred to as the "Public Work"); and

WHEREAS, said Contractor is required to furnish a bond in connection with said Contract, and pursuant to California Civil Code section 9550;

NOW, THEREFORE, We, _____, the undersigned Contractor, as Principal; and _____, a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the CHOWCHILLA ELEMENTARY SCHOOL DISTRICT and to any and all persons, companies, or corporations entitled by law to file stop notices under California Civil Code section 9100, or any person, company, or corporation entitled to make a claim on this bond, in the sum of _____ Dollars (\$ _____), such sum being not less than one hundred percent (100%) of the total amount payable by said Obligee under the terms of said Contract, for which payment will and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, its heirs, executors, administrators, successors, or assigns, or subcontractor, shall fail to pay any person or persons named in Civil Code section 9100; or fail to pay for any materials, provisions, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind; or shall fail to deduct, withhold, and pay over to the Employment Development Department, any amounts required to be deducted, withheld, and paid over by Unemployment Insurance Code section 13020 with respect to work and labor thereon of any kind, then said Surety will pay for the same, in an amount not exceeding the amount herein above set forth, and in the event suit is brought upon this bond, also will pay such reasonable attorneys' fees as shall be fixed by the court, awarded and taxed as provided in California Civil Code section 9550 et seq.

This bond shall inure to the benefit of any person named in Civil Code section 9100 giving such person or his/her assigns a right of action in any suit brought upon this bond.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefor; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described;

nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Obligee and the Contractor or on the part of any obligee named in such bond; that the sole condition of recovery shall be that the claimant is a person described in California Civil Code section 9100, and who has not been paid the full amount of his or her claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF this instrument has been duly executed by the Principal and Surety above named, on the _____ day of _____, 20__.

PRINCIPAL/CONTRACTOR:

By: _____

SURETY:

By: _____

Attorney-in-Fact

IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety's name must also appear on the Treasury Department's most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of agent or representative for service for service of process in California)

Telephone: _____

Telephone: _____

A notary public or other office completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)

) ss.

COUNTY OF)

On _____, before me, _____, personally appeared _____, who proved on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) as the Attorney-in-Fact of _____ (Surety) and acknowledged to me that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public in and for said State

(SEAL)

Commission expires: _____

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.

PERFORMANCE BOND
(CALIFORNIA PUBLIC WORK)

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, the CHOWCHILLA ELEMENTARY SCHOOL DISTRICT (sometimes referred to hereinafter as "Obligee") has awarded to _____ (hereinafter designated as the "Principal" or "Contractor"), an agreement for the work described as follows: _____ (hereinafter referred to as the "Public Work"); and

WHEREAS, the work to be performed by the Contractor is more particularly set forth in that certain contract for said Public Work dated _____, (hereinafter referred to as the "Contract"), which Contract is incorporated herein by this reference; and

WHEREAS, the Contractor is required by said Contract to perform the terms thereof and to provide a bond both for the performance and guaranty thereof.

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

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the bounded Contractor, his or her heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in said Contract and any alteration thereof made as therein provided, on his or her part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill guarantees of all materials and workmanship; and indemnify, defend and save harmless the Obligee, its officers and agents, as stipulated in said Contract, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exonerated or pro tanto) by any change, extension of time, alteration in or addition to the terms of the contract or to the work to be performed there under or the specifications accompanying the same, nor by any change or modification to any terms of payment or extension of time for any payment pertaining or relating to any scheme of work of improvement under the contract. Surety also stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exonerated or pro tanto) by any overpayment or underpayment by the Obligee that is based upon estimates approved by the Architect. The Surety stipulates and agrees that none of the aforementioned changes, modifications, alterations, additions, extension of time or actions shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, modifications,

alterations, additions or extension of time to the terms of the contract, or to the work, or the specifications as well notice of any other actions that result in the foregoing.

Whenever Principal shall be, and is declared by the Obligee to be, in default under the Contract, the Surety shall promptly either remedy the default, or shall promptly take over and complete the Contract through its agents or independent contractors, subject to acceptance and approval of such agents or independent contractors by Obligee as hereinafter set forth, in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of Liquidated Damages; or, at Obligee's sole discretion and election, Surety shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Obligee of the lowest responsible bidder, arrange for a contract between such bidder and the Obligee and make available as Work progresses (even though there should be a default or succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the "balance of the Contract Price" (as hereinafter defined), and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of Liquidated Damages. The term "balance of the Contract Price," as used in this paragraph, shall mean the total amount payable to Principal by the Obligee under the Contract and any modifications thereto, less the amount previously paid by the Obligee to the Principal, less any withholdings by the Obligee allowed under the Contract. Obligee shall not be required or obligated to accept a tender of a completion contractor from the Surety.

Surety expressly agrees that the Obligee may reject any agent or contractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Principal. Unless otherwise agreed by Obligee, in its sole discretion, Surety shall not utilize Principal in completing the Contract nor shall Surety accept a bid from Principal for completion of the work in the event of default by the Principal.

No final settlement between the Obligee and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

The Surety shall remain responsible and liable for all patent and latent defects that arise out of or relate to the Contractor's failure and/or inability to properly complete the Public Work as required by the Contract and the Contract Documents. The obligation of the Surety hereunder shall continue so long as any obligation of the Contractor remains.

Contractor and Surety agree that if the Obligee is required to engage the services of an attorney in connection with enforcement of the bond, Contractor and Surety shall pay Obligee's reasonable attorneys' fees incurred, with or without suit, in addition to the above sum.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including reasonable attorneys' fees to be fixed by the Court.

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

PRINCIPAL/CONTRACTOR:

By: _____

SURETY:

By: _____

Attorney-in-Fact

The rate of premium on this bond is _____ per thousand.

The total amount of premium charged: \$ _____ (This must be filled in by a corporate surety).

IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety's name must also appear on the Treasury Department's most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of agent or representative for service for service of process in California)

Telephone: _____

Telephone: _____

A notary public or other office completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

On _____, before me, _____, personally appeared _____, who proved on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) as the Attorney-in-Fact of (Surety) and acknowledged to me that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public in and for said State

(SEAL)

Commission expires: _____

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.

GUARANTEE

Guarantee for _____ . We hereby guarantee that the _____, which we have installed in _____ has been done in accordance with the Contract Documents, including without limitation, the drawings and specifications, and that the work as installed will fulfill the requirements included in the bid documents. The undersigned and its surety agrees to repair or replace any or all such work, together with any other adjacent work, which may be displaced in connection with such replacement, that may prove to be defective in workmanship or material within a period of _____ One (____1____) year from the date of the Notice of Completion of the above-mentioned structure by the Chowchilla Elementary School District, ordinary wear and tear and unusual abuse or neglect excepted.

In the event the undersigned or its surety fails to comply with the above-mentioned conditions within a reasonable period of time, as determined by the District, but not later than ten (10) days after being notified in writing by the District or within forty eight (48) hours in the case of an emergency or urgent matter, the undersigned and its surety authorizes the District to proceed to have said defects repaired and made good at the expense of the undersigned and its surety, who will pay the costs and charges therefor upon demand. The undersigned and its surety shall be jointly and severally liable for any costs arising from the District's enforcement of this Guarantee.

Countersigned

(Proper Name)

(Proper Name)

By: _____

By: _____

(Signature of Subcontract or Contractor)

(Signature of General Contractor if for Subcontractor)

Representatives to be contacted for service:

Name: _____

Address: _____

Phone Number: _____

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the **Chowchilla Elementary School District, 355 N. 5th Street, Chowchilla, CA 93610**, hereinafter called "Owner", and _____ whose address is _____, hereinafter called "Contractor", and _____ whose address is _____, hereinafter called "Escrow Agent".

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

1. Pursuant to Section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for Retention earnings required to be withheld by Owner pursuant to the Construction Contract entered into between the Owner and Contractor for _____ in the amount of _____ dated _____ (hereinafter referred to as 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 Contract earnings, the Escrow Agent shall notify the Owner within ten (10) days of deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as Retention under the terms of the Contract between the Owner and Contractor. Securities shall be held in the name of the Owner, and shall designate the Contractor as beneficial owner.
2. The Owner shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.
3. When the Owner makes payments of Retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as the escrow created under this Contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the Escrow Agent directly.
4. 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 the 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 a right to draw upon the securities in the event of default by the Contractor. Upon seven (7) days' written notice to the Escrow Agent from the Owner of the notice of default under Article 2.2, Article 9.6 or Article 14, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the Owner.

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 the Contractor pursuant to Sections (5) to (8), inclusive, 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. The names of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of Owner:

Title

Name

Signature

Address

On behalf of Contractor:

Title

Name

Signature

Address

On behalf of Agent:

Title

Name

Signature

Address

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.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date set forth above.

OWNER

CONTRACTOR

Title

Title

Name

Name

Signature

Signature

INSURANCE DOCUMENTS & ENDORSEMENTS

The following insurance endorsements and documents must be provided to the Chowchilla ElementarySchool District within five (5) calendar days after receipt of notification of award. If the apparent low bidder fails to provide the documents required below, the District may award the Contract to the next lowest responsible and responsive bidder or release all bidders, and the bidder’s bid security will be forfeited. All insurance provided by the bidder shall fully comply with the requirements set forth in Article 11 of the General Conditions.

1. **General Liability Insurance:** Certificate of Insurance with all specific insurance coverages set forth in Article 11 of the General Conditions, proper Project description, designation of the District as the Certificate Holder, a statement that the insurance provided is primary to any insurance obtained by the District and minimum of 30 days’ cancellation notice. Bidder shall also provide required additional insured endorsement(s) designating all parties required in Article 11 of the General Conditions. The additional insured endorsement shall be an ISO CG 20 10 (04/13), or an ISO CG 20 38 (04/13), or their equivalent as determined by the District in its sole discretion.

Incidents and claims are to be reported to the insurer at:

Attn: _____
(Title) _____ (Department)

(Company)

(Street Address)

(City) _____ (State) _____ (Zip Code)

(_____) _____
(Telephone Number)

2. **Workers’ Compensation/ Employer’s Liability Insurance:** Certificate of Workers’ Compensation Insurance meeting the coverages and requirements set forth in Article 11 of the General Conditions, minimum of 30 days’ cancellation notice, proper Project description, waiver of subrogation and any applicable endorsements.

3. Automobile Liability Insurance: Certificate of Automobile Insurance meeting the coverages and requirements set forth in Article 11 of the General Conditions, minimum 30 days' cancellation notice, any applicable endorsements and a statement that the insurance provided is primary to any insurance obtained by the District.

Incidents and claims are to be reported to the insurer at:

Attn: _____
(Title) (Department)

(Company)

(Street Address)

(City) (State) (Zip Code)

(Telephone Number)

DATE: _____ CONTRACTOR _____

By: _____
Signature

DISABLED VETERAN BUSINESS ENTERPRISE (DVBE) CONTRACTOR CLOSE-OUT STATEMENT

The Contractor shall complete this form, as a condition to Final Payment, for purposes of reporting participation by Disabled Veteran Business Enterprises (DVBE) in the Contract for the Project/Bid No. specified below.

Project Name: _____

Bid No.: _____

DSA No.: _____

Name	Address/Phone	Category of Work*	\$ Amount of Contract

* Categories of work include: (1) construction services (specify services that DVBE will provide); (2) architecture and engineering services; (3) procurement of materials, supplies and equipment; and (4) information technology.

The undersigned, on behalf of the Contractor, certifies that DVBE participation on the Contract for Bid No. _____ equaled _____ dollars (\$ _____), which represents approximately _____ percent (____%) of the total Contract price including change orders for the Project.

Company: _____

Name: _____

Title: _____

Signature: _____

Date: _____

GENERAL CONDITIONS

ARTICLE 1 DEFINITIONS

1.1 BASIC DEFINITIONS

NOTE: The following shall not be construed as a comprehensive list of all definitions in the Contract Documents and there may be other definitions set forth in the Contract Documents. Additionally, any references to any DSA forms, documents or requirements shall be construed to incorporate any updates, supplements, or additions. The Contractor shall be required to meet the latest DSA requirements applicable to the Project.

1.1.1 Action of the Governing Board is a vote of a majority of the District's Governing Board.

1.1.2 Approval means written authorization through action of the Governing Board. In no case shall the Governing Board have authority to approve total Change Orders or Modifications to the Project exceeding 10% of the Contract Sum.

1.1.3 Architect means the architect, engineer, or other design professional engaged by the District to design and perform general observation of the work of construction and interpret the Drawings and Specifications for the Project. (Also see Article 4)

1.1.4 As-Builts are a set of Plans and Specifications maintained by the Contractor clearly showing all changes, revisions, substitutions, field changes, final locations, and other significant features of the Project. The As-Builts shall be maintained continuously throughout the Work for the Project and is both a prerequisite to the issuance of Payment Application and a requirement for Contract Close-Out. (See Article 3.17)

1.1.5 Beneficial Occupancy is the point in time when a building or buildings are fit for occupancy is fit for occupancy and its intended use. Basic requirements are the building is safe, at or near Substantial Completion, and all fire/ life safety items are approved and operational. The fact that a building is occupied does not mean that the building is ready for Beneficial Occupancy if there are elements that are unsafe or if fire/ life safety items are not approved and operational. Taking occupancy on a structure that is under a fire watch is not considered beneficial occupancy. Further, taking of Beneficial Occupancy is not a point in time when retention is due unless the entire Project or portion thereof has obtained a Certificate of Substantial Completion that meets the definition of 1.1.46.

1.1.6 Claims. A Claim is a request for payment, supported by back-up documentation which includes, invoices time sheets, or other documents substantiating legitimacy or entitlement that is submitted during the Project or immediately following the Project made prior to the Final Retention Payment Application and prior to Final Completion of the Project. A "Claim" means a separate demand by the Contractor for (1) time extension, (2) payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the CONTRACT and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (3) and amount the payment of which is disputed by the District. (See Article 4.6).

GENERAL CONDITIONS

1.1.7 Change Order (CO). A CO is a written instrument prepared by the Architect and signed by the District (as authorized by the District's Governing Board), the Contractor, and the Architect, stating their agreement upon (1) A description of a change in the Work, (2) The amount of the adjustment in the Contract Sum, if any; and (3) The extent of the adjustment in the Contract Time, if any. (See Article 7.2)

1.1.8 Change Order Request (COR). A COR is a written request supported by backup documentation prepared by the Contractor requesting that the District and the Architect issue a CO based upon a proposed change, or a change that results in an adjustment in cost, time or both, or arising from an RFP, CCD or ICD. (See Article 7.6)

1.1.9 Close-Out means the process for Final Completion of the Project, but also includes the requirements for the DSA Certification that the Project is Complete (See DSA Certification Guide). (See Article 9.9)

1.1.10 Construction Change Document (CCD). A Construction Change Document is a DSA term that is utilized to address changes to the DSA approved Plans and Specifications. There are two types of Construction Change Documents. (1) DSA approved CCD Category A for work affecting structural, access or fire/ life safety of the Project which will require a DSA approval; and, (2) CCD Category B for work NOT affecting structural safety, access compliance or fire/ life safety that will not require a DSA approval (except to confirm that no approval is required). Both CCD Category A and Category B shall be set forth in DSA Form 140 and submitted to DSA as required. (See Article 7.3)

1.1.11 Complete/ Completion/ Final Completion means that all Work in the Contract Documents is finished, the requirements of the Contract Documents have been met, the Project has been Closed Out, and all Work has ceased on the Project. This may also be referred to as Final Completion. In most cases, the recording of a Notice of Completion shall represent Completion of the Project. Beneficial Occupancy does not mean the Work is Complete.

1.1.12 Completion Date is the date when all Work for the Project shall be Substantially Complete and is the date assigned at the end of the Contract Time for the Project. (See Article 1.1.46)

1.1.13 Construction Manager. The Construction Manager is a consultant to the District contracted to assist in Project planning, management and construction of the Project. If there is a Construction Manager, they may assist in various aspects of the Project including, but not limited to Monitoring the progress of the construction, reviewing and monitoring the schedule, progress of work, monitoring pay requests, facilitating communications, advising the District and its Board of Education on various aspects of the construction process, monitoring the RFI, COR, CCD, ICD, RFP, Claims, Disputes and other Project related processes.

1.1.14 Contract or Agreement when the terms are used in these General Conditions shall be references to the Contract Documents as defined herein.

1.1.15 Contract Documents (sometimes referred to as Construction Documents) consist of the Agreement between District and Contractor (hereinafter the Agreement or Contract), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to bid, instructions to bidders, notice to bidders, and the requirements contained in the Bid Documents, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is a written amendment to the Contract signed by parties, a Change Order, a Construction

GENERAL CONDITIONS

Change Document, or a written order for a minor change in the Work issued by the Architect. The Contract Documents collectively form the Contract. 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 written Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Architect and Contractor, between the District and any Subcontractor or Sub-subcontractor, or between any persons or entities other than the District 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.

1.1.16 Contract Time is the time period specified in the Contract Documents in which the Project shall be completed. This is sometimes referred to a Contract Duration, or "time in which the Contractor has to complete the Project" (See Article 8.1.1).

1.1.17 Contractor, District, and Architect are those mentioned as such in the Agreement. They are treated throughout the Contract Documents as if they are of singular number and neuter gender. Any reference to "Owner" shall mean "District" or Chowchilla ElementarySchool District.

1.1.18 Cure is the act of remedying a material failure to perform under the terms of the Contract Documents during the time provided to correct Contractor's Default. Specific time periods are provided to Cure and Correct a Contractor Default under Article 14 and for a Partial Default under Article 2.2 as well as elsewhere in the Contract Documents.

1.1.19 Days mean calendar days unless otherwise specifically stated.

1.1.20 Default is a material breach of Contract. A Termination for Cause under Article 14 is a declaration of Default of the Contract and shall act as a demand upon the Surety to perform under the terms of the Performance Bond. Partial Defaults may also be tendered to the Surety at District's discretion (See Article 2.2).

1.1.21 Dispute. A dispute is a disagreement on terms or conditions of the Project where the Contractor's opinion of the Project, Payment, Change Order or Request for Proposal differs from that of the District or Architect. A dispute only rises to the level of a claim once the dispute is assembled with back-up documentation and presented for evaluation (See Article 4.6).

1.1.22 District Representative is the person designated by the District to represent the District during the Construction for the Project. This District Representative shall have the delegated authority as further defined in Article 1.1.2. This District Representative may be an employee of the District who may have the delegated authority as set forth in Article 1.1.3, and may also include Construction Managers. In some cases, the District and its Board may be assisted by a Construction Manager. When a Construction Manager is assisting the District, the Contractor, Architect, and Inspector shall have a primary contact with the District's Construction Manager who will advise the District.

1.1.23 Drawings or Plans are graphic and pictorial portions of the Contract Documents prepared for the Project and approved changes thereto, wherever located and whenever issued, showing the design, location, and scope of the Work, generally including Plans, elevations, sections, details, schedules, and diagrams as drawn or approved by the Architect. Sometimes Drawings will also be included in Addenda, Change Orders, and Specifications.

GENERAL CONDITIONS

1.1.24 DSA is the Division of State Architect. DSA is the agency that provides design and construction oversight for K-12 Schools, Community Colleges, and State Funded Charter School Projects. DSA is the responsible agency for this Project and Contractor has submitted a bid for the Project since Contractor is familiar with Contractor's responsibilities under the DSA requirements more thoroughly set forth at Title 24 of the California Code of Regulations. Contractor agrees to abide by the jurisdiction of DSA and shall construct the Project to conform with the approved Plans, Specifications, Addenda, and Change Orders (inclusive of approved CCD's and ICD's issued by the District pending CCD approval). See DSA website.

1.1.25 Emergency shall be defined as a sudden, unexpected occurrence, involving a clear and imminent threat to the continuation of classes, a critical path delay that will result in not being able to occupy the campus when students arrive to use the facility, danger from the facility or from outside the facility, Act of God, or other action which requires immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

1.1.26 Float the total number of days an activity may be extended or delayed without delaying the Completion Date shown in the schedule. Float will fall into three categories: (1) Rain Days; (2) Governmental Delays; and, (3) Project Float (See Article 8.1.4).

1.1.27 Immediate Change Directive. (ICD) A written order prepared by the Architect and signed by the District and the Architect, directing a change in the Work where the Work must proceed immediately and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. See Article 7.3

1.1.28 Inspector of Record (IOR)/ Project Inspector (PI) is the individual retained by the District in accordance with Title 24 of the California Code of Regulations and who will be assigned to the Project

1.1.29 Notice of Non-Compliance (DSA Form 154) is a document issued by the Inspector if there is a deviation from the DSA approved Plans, Specifications, and Change Orders. (See Article 7.1.2)

1.1.30 Payment Application or Certificate of Payment is the Contractor's certified representation of the actual level of Work performed on the Project. Payment Applications are sometimes also called "Certificate of Payment", "Request for Payment", "Payment Application", or similar terms, and shall follow the Schedule of Values that are approved by the Architect, Inspector and District (See Article 9.3)

1.1.31 Project is the complete construction of the Work performed in accordance with the Contract Documents.

1.1.32 Project Manual is the volume assembled for the Work which may include, without limitation, the bidding requirements, sample forms, Conditions of the Contract, and Specifications.

1.1.33 Provide shall include "provide complete in place," that is "furnish and install complete."

1.1.34 Punch List/ Punch Item/ Incomplete Punch Item is a list of minor repair items, prepared after the issuance of a Certificate of Substantial Completion, by the Inspector and Architect of Work required in order to complete the Contract Documents and ensure compliance with the DSA Approved Plans so the Project may be Closed Out. Issuance of the Retention Payment is dependent of the proper completion of the Punch List (See Article 9.9)

GENERAL CONDITIONS

1.1.34.1 Contractor's List of Punch Items is a list of minor repair items the Contractor submits when the Contractor considers the Work Substantially Complete. Submission of this List of Incomplete Punch Items is the Contractor's representation that the Project is Substantially Complete (See Article 9.9.1)

1.1.35 Request for Information (RFI) is a written request prepared by the Contractor requesting the Architect to provide additional information necessary to clarify or amplify an item which the Contractor believes is not clearly shown or called for in the Drawings or Specifications, or to address problems which have arisen under field conditions (See Article 7.4)

1.1.36 Request for Proposal (RFP) is a written request prepared by the Architect (and/or CM) requesting the Contractor to submit to an estimate of the effect of a proposed change on the Contract Price and (if applicable) the Contract Time (See Article 7.5)

1.1.37 Safety Orders are those issued by any city, county, state or federal agency having jurisdiction over the Project.

1.1.38 Schedule is the Contractor's view of the practical way in which the Work will be accomplished. In this Agreement there is a requirement for a Baseline Schedule and regular Schedule Updates that show all Work to be completed during the Contract Time and shall include all items listed under Article 8.3.2.9. See Article 8 of the General Conditions.

1.1.39 Schedule of Values is a detailed breakdown of the Contract Price for each Project, building, Phase of Work or Site as determined by the District. This Schedule of Values shall adequately detail the price for the Work so Progress Payments Applications can be meaningfully reviewed by the Inspector, Architect of Record, Engineer of Record, and District (See Article 9.2).

1.1.40 Separate Contracts are Contracts that the District may have with other Contractors, vendors, suppliers, or entities to perform Work on the Project. This may include, but is not limited to Multi-Prime Trade Contractors, furniture installers, testing agencies, clean-up contractors, or network or low voltage contractors. Contractor shall plan for certain other contractors that may also be working on the Project site and address these other contractors in Contractor's Schedule (See Article 6).

1.1.41 Site refers to the grounds of the Project as defined in the Contract Documents and such adjacent lands as may be directly affected by the performance of the Work.

1.1.42 Specifications are that portion of the Contract Documents consisting of the written requirements for material, equipment, construction systems, instructions, quality assurance standards, workmanship, and performance of related services.

1.1.43 Standards, Rules, and Regulations referred to are recognized printed standards and shall be considered as one and a part of these Specifications within limits specified. Federal, state and local regulations are incorporated into the Contract Documents by reference.

1.1.44 Stop Work Order, or an Order to Comply, is issued when either (1) the Work proceeds without DSA approval; (2) the Work proceeds without a DSA Inspector of Record, or (3) where DSA determines that the Work is not being performed in accordance with applicable rules and regulations, and would compromise the structural integrity of the Project or would endanger lives. If a Stop Work Order is issued, the Work in the affected area shall cease until DSA withdraws the Stop Work Order. Pursuant to

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Education Code section 8133.5, the District shall not be held liable in any action filed against the District for any delays caused by compliance with the Stop Work Order

1.1.45 Subcontractor, as used herein, includes those having direct or indirect contracts with Contractor and ones who furnished labor, material or services for a special design according to Plans, Drawings, and Specifications of this Work. (See Article 5)

1.1.46 Substantial Completion/ Substantially Complete(d) is not reached unless and until each of the following four (4) conditions have been met: (1) all contractually required items have been installed with the exception of only minor and Incomplete Punch List Items (See Article 9.9.1.1); (2) All Fire/Life Safety Systems have been installed, and are working and signed off on the DSA Form 152 Inspection Card, and all building systems including mechanical, electrical and plumbing are all functioning; (3) all other items DSA Form 152 Inspection Card for the Project have been approved and signed off; and (4) the Project is fit for occupancy and its intended use. For the purposes of this Contract, any references to Completion Date mean Substantial Completion Date.

1.1.47 Substitution is a change in product, material, equipment, or method of construction from those required by the Construction Documents proposed by the Contractor. For this Project, a Substitution is subject to the filing of a Construction Substitution Request Form at the time of bid and meeting the requirements of Article 3.10.

1.1.48 Supplementary Conditions/ Supplementary General Conditions/ Special Conditions are terms that are sometimes used interchangeably and refer to any additional requirements or changes to the General Conditions as noted.

1.1.49 Surety is the person, firm, or corporation that executes as a bid bond, Payment Bond or Performance Bond guarantor on the Contractor's Bid, Contractor's Performance on the Contract and Payment of the Contractor's Subcontractors, material suppliers, vendors and labor on the Project. The Surety is bound to the same extent as the Contractor is bound once a Default occurs. A default includes a Termination for Substantial Failure to Perform under Article 14, but also includes any breach of Contract and is subject to the requirements and responsibilities as set forth in the Performance Bond.

1.1.50 Work shall include all labor, materials, services and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents. It shall include the initial obligation of any Contractor or Subcontractor who performs any portion of the Work, to visit the Site of the proposed Work (a continuing obligation after the commencement of the Work), to fully acquaint and familiarize itself with the conditions as they exist and the character of the operations to be carried out under the Contract Documents, and make such investigation as it may see fit so that it shall fully understand the facilities, physical conditions, and restrictions attending the Work under the Contract Documents. Each such Contractor and its Subcontractors shall also thoroughly examine and become familiar with the Drawings, Specifications, and associated Contract Documents and bid documents before preparing and submitting any bid.

1.1.51 Workers include laborers, workers, and mechanics.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 Correlation and Intent

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1.2.1.1 *Documents Complementary and Inclusive.* The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work. All Contract Documents form the Contractor's Contract with the District. Any item of Work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by Contractor as if shown or mentioned in both. The Contractor is bound to provide the Work complete and is under a legal duty to carefully study Plans and schedule operations well ahead of time and identify inconsistencies with the Plans and Specifications and call such inconsistencies to the attention of the Architect or Registered Engineer through the Inspector under Section 4-343(b) of Title 24.

1.2.1.2 *Work to be Complete.* Contractor has thoroughly studied the Contract Documents and understands that the District contracted with Contractor to provide a complete Project which means complete systems and buildings. The entire set of Contract Documents shows a complete Project and Contractor agrees that there are multiple disciplines putting together a set of Contract Documents. Thus, if portions of a system are shown on some Drawings and not others, this does not mean the Contractor is to only provide part of a system. For example, if an air conditioning unit is shown on the mechanical Drawings, the plumbing for the air conditioning is shown on another Drawing, and the electrical shown on the electrical Drawings, the Contractor is to provide a complete and working air conditioning system. The only time when an item is supplied incomplete is if the system is shown specifically as incomplete since others will be completing the system. Work includes, but is not limited to materials, workmanship, and manufacture of fabrication of components for the Project.

1.2.1.3 *Coverage of the Drawings and Specifications.* The Drawings and Specifications generally describe the Work to be performed by Contractor. Generally, the Specifications describe Work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown. All materials or labor for Work, which is shown on either the Drawings or the Specifications (or is reasonably inferable therefrom as being necessary to complete the Work), shall be provided by the Contractor. The Contractor is responsible for the whole Project as contractually set forth as the Contract Documents. It is intended that the Work be of sound, quality construction, and the Contractor shall be responsible for the inclusion of adequate amounts to cover installation of all items indicated, described, or implied in the portion of the Work to be performed by them.

1.2.1.4 *Conflicts.* In the event there is a discrepancy between the various Contract Documents, it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.

1.2.1.5 *Conformance with Laws.* Each and every provision of law required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, even if through mistake or otherwise any such provision is not inserted, or is not correctly inserted.

Before commencing any portion of the Work, Contractor shall check and review the Drawings and Specifications for such portion for conformance and compliance with all laws, ordinances, codes, rules and regulations of all governmental authorities and public and municipal utilities affecting the construction and operation of the physical plant of the Project, all quasi-governmental and other regulations affecting the construction and operation of the physical plant of the Project, and other special requirements, if any, designated in the Contract Documents. Such checking shall include review of Title 24 of the California Code of Regulations, California Building Code, local utility, local water

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connection, local grading and all other applicable agencies. In the event Contractor observes any violation of any law, ordinance, code, rule or regulation, or inconsistency with the Contract Documents, Contractor shall, within five (5) days, notify the Inspector, Architect and District in writing of same and shall ensure that any such violation or inconsistency shall be corrected in the manner provided hereunder prior to the construction of that portion of the Project. (See Title 24 Section 4-343)

The Contractor shall bear all expenses of correcting Work done contrary to said laws, ordinances, rules, and regulations if the Contractor performed same (1) without first consulting the Architect for further instructions regarding said Work or (2) disregarded the Architect's instructions regarding said Work.

1.2.1.6 *Ambiguity and Inconsistency.* Before commencing any portion of the Work, Contractor shall carefully examine all Drawings and Specifications and other information given to Contractor as to materials and methods of construction and other Project requirements. Prior to commencing any portion of the Work, Contractor shall notify Architect and District in writing of any perceived or alleged error, inconsistency, conflict, ambiguity, or lack of detail or explanation in the Drawings and Specifications in the manner provided herein. If the Contractor or its Subcontractors, material or equipment suppliers, or any of their officers, agents, and employees performs, permits, or causes the performance of any Work under the Contract Documents, which it knows or should have known to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all costs arising therefrom including, without limitation, the cost of correction thereof without increase or adjustment to the Contract Price or the time for performance. Contractor shall maintain an adequate inspection system and perform personal observations and review work and pre-plan the project to ensure the Work performed under the Contract conforms to Contract requirements. Contractor shall maintain records of such review and observation to ensure strict compliance with the terms of the Contract.

1.2.1.7 *Typical Parts and Sections.* Whenever typical parts or sections of the Work are completely detailed on the Drawings, and other parts or sections which are of the same construction are shown in outline only, the complete or more detailed shall apply to the Work which is shown in outline.

1.2.1.8 *Dimensions.* Dimensions of Work shall not be determined by scale or rule. Figured dimensions shall be followed at all times. If figured dimensions are lacking on Drawings, Architect shall supply them on request. The Architect's decisions on matters relating to aesthetic effect will be final.

1.2.2 Addenda and Deferred Approvals

1.2.2.1 *Addenda* are the changes in Specifications, Drawings, Contract Documents, and Plans which have been authorized in writing by the District or Architect, and which alter, explain, or clarify the Contract Documents. Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda unless otherwise specified in the addenda.

1.2.2.2 *Deferred Approvals.* Deferred Approvals are Submittals that are reviewed by the Architect (or Engineer of Record) and submitted to DSA for approval based on thorough detailing of manufacturer and Project specific design. See Article 3.9.1 and 3.9.3. The Deferred Approval item cannot be fully detailed on the originally approved Drawings or Specifications because of variations in product design and manufacture. Contract Documents which require Deferred Approval items are meant to be for illustration purposes only. Approval of Plans for such a portion of the Work may be deferred until the material suppliers and Subcontractors are selected. All Deferred Approvals are noted in the Plans and Specifications. Contractor is responsible for all Deferred Approval requirements set forth in the Contract Documents. Contractor is responsible to comply with all laws, building codes, Title 24 and regulations

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necessary to obtain all necessary approvals, including those required from the Division of the State Architect (“DSA”) and the State Fire Marshall. Contractor shall not be granted an extension of time for failure to plan, schedule for and obtain necessary approvals. Contractor shall Schedule all Deferred Approval items in the Baseline Schedule and Schedule Updates under Article 3.9.6

1.2.3 Specification Interpretation

1.2.3.1 *Titles.* The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved.

1.2.3.2 *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.

1.2.3.3 *General Conditions.* The General Conditions and Supplementary General Conditions are a part of the Contract Documents which further defines and refines the Contract entered between the Contractor and District.

1.2.3.4 *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. 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.

1.2.3.5 *Plural.* Words in the singular shall include the plural whenever applicable or the context so indicates.

1.2.3.6 *Metric.* The Specifications may indicate metric units of measurement as a supplement to U.S. customary units. When indicated thus: 1” (25 mm), the U. S. 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.”

1.2.3.7 *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 at the date of the Contractor’s proposal unless directed otherwise. 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.

1.2.4 Rules of Document Interpretation

1.2.4.1 In the event of conflict within the Drawings, the following rules shall apply:

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- a. General Notes, when identified as such, shall be incorporated into other portions of Drawings.
- b. Schedules, when identified as such, are complementary with other notes and other portions of Drawings including those identified as General Notes.
- c. Larger scale Drawings shall take precedence over smaller scale Drawings.
- d. At no time shall the Contractor base construction on scaled Drawings.

1.2.4.2 Specifications shall govern as to materials, workmanship, and installation procedures.

1.2.4.3 If Contractor observes that Drawings and Specifications are in conflict, Contractor shall, prior to commencing work, notify the Architect in writing for the purposes of obtaining an interpretation of the Contact Documents.

1.2.4.4 In the case of conflict or inconsistencies, the order of precedence shall be as follows:

- a. General Conditions take precedence over Drawings and Specifications.
- b. Supplemental Conditions take precedence over General Conditions.
- c. The Agreement Form shall take precedence over the Supplemental Conditions.
- d. In the case of disagreement or conflict between or within Specifications, and Drawings, the more stringent, higher quality, and greater quantity of Work shall apply.
- e. Addenda shall take precedence over Drawings and Specifications.
- f. General Conditions shall take precedence over Addenda.
- g. Drawings and Specifications take precedence over the Soils Report.

1.3 OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

The Drawings, Specifications, and other Contract Documents for the Project are the property of the District and/or Architect pursuant Contract requirements between the District and Architect. The Contractor may retain one Contract record set. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a Copyright in the Drawings, Specifications, and other documents prepared by the Architect. All copies except the Contractor's record set, shall be returned or properly accounted for upon completion of the Work. The Drawings, Specifications, and other documents prepared by the Architect, and copies thereof furnished to the Contractor 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. The District and/or Architect hereby grants the Contractor,

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Subcontractors, Sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings, Specifications, and other documents prepared for the Project 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 District's property interest or other reserved right.

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ARTICLE 2 DISTRICT

2.1 INFORMATION AND SERVICES REQUIRED OF THE DISTRICT

2.1.1 Site Survey

The District will furnish, at its expense, a legal description of the Site and a land survey showing the boundaries of the Site. Contractor shall be responsible for all surveys regarding location of construction, grading and site work.

2.1.2 Soils

When required by the scope of the Project, the District will furnish, at its expense, the services of geotechnical engineers or consultants when reasonably required and deemed necessary by the Architect or as required by local or state codes. Such services, with written reports and appropriate written professional recommendations, may include test boring, test pits, soil bearing values, percolation tests, air and water pollution tests, and ground corrosion and resistivity tests, including necessary operations for determining subsoil, air, and water conditions.

2.1.3 Soils Report Part of the Contract Documents: Contractor Reliance

A soils investigation report has been obtained from test holes at the Site, and such report is incorporated into this Contract and made available for the Contractor's use in preparing its bid and Work under this Contract. Where the Plans and Specifications are more specific and provide more significant structure, systems, reinforcing, thicknesses, or construction methods, the Drawings shall control over the soils report. The soils report is available at the Architect's office for review and it is Contractor's responsibility to ensure that Contractor has reviewed the soils investigation report. Any information obtained from such report or any other information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only. If, during the course of Work under this Contract, Contractor encounters subsurface conditions which differ materially from those indicated in the soils report, then Contractor shall notify the District within five (5) calendar days of discovery of the condition, and changes to the Contract Price may be made in accordance with Article 7 entitled "Changes in the Work." Contractor agrees that no claim against District will be made by Contractor for damages and hereby waives any rights to damages in the event the Contractor fails to notify District within the five-day period mentioned above.

WARNING: DISTRICT DOES NOT WARRANT THE SOILS AT THE PROJECT SITE. CONTRACTOR HAS REVIEWED AND IS FAMILIAR WITH THE REQUIREMENTS OF THE SOILS INVESTIGATION REPORT. CONTRACTOR UNDERSTANDS THAT PLANS, DRAWINGS AND SPECIFICATIONS SUPERSEDE THE SOILS REPORT IF THERE ARE CONFLICTS. FURTHER, IN ADDITION TO THE INFORMATION IN THE SOILS REPORT, CONTRACTOR HAS CONDUCTED AN INDEPENDENT INVESTIGATION OF THE PROJECT SITE AND THE SOILS CONDITIONS OF THE SITE. DISTRICT DOES NOT WARRANT THE SOILS CONDITIONS OF THE SITE AND CONTRACTOR IS FULLY RESPONSIBLE TO ASCERTAIN SITE CONDITIONS FOR THE PURPOSES OF DETERMINING CONSTRUCTION MEANS AND METHODS PRIOR TO COMMENCING CONSTRUCTION.

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2.1.4 Utilities

2.1.4.1 *Location of Point of Connection.* The locations shown for the point of connection are approximate. It shall be the responsibility of the Contractor to determine the exact location of all service connections.

2.1.4.2 *Regional Notification Center.* Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) business days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. See Government Code section 4216.3. No excavation shall be commenced and carried out by the Contractor unless such an inquiry identification number has been assigned to the Contractor or any Subcontractor of the Contractor and the District has been given the identification number by the Contractor. Any damages arising from failure to make appropriate regional notification shall be at the sole risk of Contractor. Contractor shall solely be responsible for any fines, penalties or damages for violation of this Article and Government Code section 4216.6 or 4216.7. Any delays caused by failure to make appropriate regional notification shall be at the sole risk of Contractor and shall not be considered for extension of time pursuant to Article 8.4.

2.1.4.3 *Utilities - Removal and Restoration.* The District has endeavored to determine the existence of utilities at the Site of the Work from the records of the District of known utilities in the vicinity of the Work. The positions of these utilities as derived from such records are shown in the Contract Documents. Thus, the locations of the main or trunklines located on the Drawings are approximate locations and not exact.

No excavations were made to verify the locations shown for underground utilities. Other than the main or trunkline, which the District has endeavored to locate on the Plans, service connections or laterals to these utilities may not be shown on the Plans. It shall be the responsibility of the Contractor to determine the exact location of all service connections. The Contractor shall make its own investigations, including exploratory excavations, to determine the locations and type of service connections, prior to commencing work which could result in damage to such utilities. The Contractor shall immediately notify the District's representative as to any utility main or trunkline discovered by Contractor in a different position than provided by the Regional Notification Center. With respect to main or trunklines, Contractor is to immediately notify District if the location is substantially different than as shown in the Contract Documents.

Contractor shall coordinate its Work with all utilities, including, but not limited to electricity, water, gas and telephone and meet with said utilities prior to the start of any work. Contractor shall show timing of all utility coordination activities under the Scheduling requirements of Article 8.

2.1.4.4 *Other Utilities.* In case it should be necessary to remove, relocate, or temporarily maintain a utility because of interference with the Work, the work on the utility shall be performed and paid for as follows:

When it is necessary to remove, relocate or temporarily maintain a service connection, the cost of which is not required to be borne by the owner of the service connection, the Contractor shall bear all expenses incidental to the work on the service connection. The work on the service connection shall be done in a manner satisfactory to the owner thereof; it being understood that the owner

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of the service connection has the option of doing such work with his own forces or permitting the work to be done by the Contractor.

When it is necessary to remove, relocate, or temporarily maintain a utility which is in the position shown on the Plans, the cost of which is not required to be borne by the owner thereof, the Contractor shall bear all expenses incidental to the work on the utility. The work on the utility shall be done in a manner satisfactory to the owner thereof; it being understood that the owner of the utility has the option of doing such work with his own forces or permitting the work to be done by the Contractor.

When it is necessary to remove, relocate, or temporarily maintain a utility which is not shown on the Plans or is in a position different from that shown on the Plans and were it in the position shown on the Plans would not need to be removed, relocated, or temporarily maintained, and the cost of which is not required to be borne by the owner thereof, the District will make arrangements with the owner of the utility for such work to be done at no cost to the Contractor, or will require the Contractor to do such work in accordance with Article 7 or will make changes in the alignment and grade of the Work to obviate the necessity to remove, relocate, or temporarily maintain the utility. Changes in alignment and grade will be ordered in accordance with Article 7 herein.

No representations are made that the obligations to move or temporarily maintain any utility and to pay the cost thereof is or is not required to be borne by the owner of such utility, and it shall be the responsibility of the Contractor to investigate to find out whether said cost is required to be borne by the owner of the utility.

The right is reserved to governmental agencies and to owners of utilities to enter at any time upon any street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work and for the purpose of maintaining and making repairs to their property.

2.1.5 Existing Utility Lines; Removal, Relocation

2.1.5.1 *Main or Trunkline Facilities.* If the Contractor while performing the Contract discovers utility facilities not identified in the Contract Documents, Contractor shall notify the District and utility in writing prior to commencing work.

The owner of 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.

The Contractor shall exercise reasonable care and shall be compensated by the District for the actual verified field costs of locating, and removing, relocating, protecting or temporarily maintaining such main or trunkline utility facilities located in a substantially different location than in the Plans and Specifications, and for equipment in use on the project necessarily idled during such work. This Work shall be performed in accordance with Article 7 of these General Conditions.

2.1.5.2 *Assessment.* Nothing in these subparagraphs shall be deemed to require the District 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 and could be inferred from the Main or Trunkline shown on the Drawings.

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2.1.5.3 *Notification.* If the Contractor, while performing Work under this Contract, discovers utility facilities not identified by the District in the Contract Documents. Contractor shall, within five (5) days, notify the District and the utility in writing. If Contractor fails to notify the District within forty eight hours after discovery of any utility facilities not identified by District in the Contract Documents, Contractor waives all rights to be compensated for any extra Work or damages resulting from such discovered utilities.

2.1.6 Easements

District shall secure and pay for easements for permanent structures or permanent changes in existing facilities, if any, unless otherwise specified in the Contract Documents.

2.2 DISTRICT'S RIGHT TO CARRY OUT THE WORK DUE TO PARTIAL DEFAULT IN A SPECIFIC SEGREGATED AREA OF WORK (48 HOUR NOTICE TO CURE AND CORRECT)

If the Contractor Defaults or neglects to carry out the Work in accordance with the Contract Documents, the District may provide forty-eight (48) hour written notice to cure (a shorter period of time in the case of Emergency or a critical path delay as defined in Article 2.2.1) Contractor's Partial Default in a specific segregated area of work. The District's right to issue a Partial Default of the Contractor's Work and take over that segregated area of Work includes, but is not limited to:

1. Failure to supply adequate workers on the entire Project or any part thereof;
2. Failure to supply a sufficient quantity of materials;
3. Failure to perform any provision of this Contract;
4. Failure to comply with safety requirements, or due to Contractor is creation of an unsafe condition;
5. Cases of bona fide emergency;
6. Failure to order materials in a timely manner;
7. Failure to prepare Deferred Approval items or Shop Drawings in a timely manner;
8. Failure to comply with Contractor's Baseline or Update Schedule, meet critical Milestones which would result in a delay to the critical path, or delay the Contract Time;
9. Failure to comply with the Subletting and Subcontracting Fair Practices, Public Contract Code section 4100, et seq.
10. Failure to meet the requirements of the Americans with Disabilities Act;
11. Failure to complete Punch List work;
12. Failure to proceed on an Immediate Change Directive
13. Failure to correct a Notice of Deviation

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If during the forty eight (48) hour period, the Contractor fails to Cure and correct the deficiency noted in the 48 hour notice of Partial Default with diligence and promptness, the District may correct such deficiencies without prejudice to other remedies the District may have, including a Termination for Cause as set forth in Article 14. If there are inadequate funds remaining the Project balance or in the Retention Escrow to address at least 150% of the costs set forth in the Article 2.2 notice, the District may copy the Surety on the written notice of Partial Default. If a notice to the Surety is provided, except in the cases of emergency or critical path delay, the Surety has the option to take over and complete the Work described in the written notice if Surety personally delivers notice to District that it intends to perform such work. In the case where written notice has been provided, the District shall allow Surety seven (7) days to perform the Work.

2.2.1 Service of Notice of Partial Default with Right to Cure

A written notice of Partial Default and right to cure under Article 2.2 (“Article 2.2 Notice” or “Notice of Partial Default”) shall be served by e-mail (with a copy provided by regular mail) to the e-mail address provided on the Bid submitted and copied to the Project Superintendent.

2.2.2 Shortened Time for Partial Default in the Case of Emergencies

In an Emergency situation, the District may correct any of the deficiencies described in Article 2.2 without prejudice to other remedies by providing service of written notice of Emergency requiring a shortened time for Partial Default specifying the time given to cure, if any.

2.2.3 Shortened Time for Partial Default in the Case of Critical Path Delay

In the case of critical path delay, the District may correct any of the deficiencies described in Article 2.2 without prejudice to other remedies providing service of written notice of critical path delay to the Contractor with a specific description of the critical path delay items noting the line item or area of Work that is on the critical path and prescribe the length of shortened time to cure, if any.

2.2.4 Written Notice of Partial Default to be Deducted by Deductive Change Order

The District shall have the right to determine the reasonable value of the Article 2.2 Partial Default Work, or if there is an actual value for the Work, shall use that value and issue a Deductive Change Orders under Article 7.7.4.

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ARTICLE 3 THE CONTRACTOR

3.1 SUPERVISION AND CONSTRUCTION PROCEDURES

3.1.1 Contractor

The Contractor shall continually 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, procedures; and shall coordinate all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. The Contractor shall not perform the Work without utilizing the Contract Documents or, where required, approved Submittals, Shop Drawings, or samples for any such portion of the Work. If any of the Work is performed by contractors retained directly by the District, Contractor shall be responsible for the coordination and sequencing of the work of those other contractors so as to avoid any impact on the Project Schedule pursuant to the requirements of Article 6 and Article 8. Specific duties of the Contractor shall include those set out in Section 43 of Title 21 of the California Code of Regulations and Section 4-343 of Title 24 of the California Code of Regulations. These duties include, but are not limited to the following:

3.1.1.1 *Responsibilities.* It is the duty of the Contractor to complete the Work covered by his or her Contract in accordance with the approved Plans and Specifications. The Contractor in no way is relieved of any responsibility by the activities of the Architect, Engineer, Inspector or DSA in the performance of their duties.

3.1.1.2 *Performance of the Work.* The Contractor shall carefully study the approved Plans and Specifications and shall plan its schedule of operations well ahead of time. If at any time it is discovered that work is being done which is not in accordance with the approved Plans and Specifications, the Contractor shall correct the Work immediately.

3.1.2 Contractor Responsibility to Study the Plans and Specifications

All inconsistencies or timing or sequences which appear to be in error in the Plans and Specifications shall promptly be called to the attention of the Architect or, Engineer, for interpretation or correction. Local conditions which may affect the structure shall be brought to the Architect's attention at once. In no case, shall the instruction of the Architect be construed to cause work to be done which is not in conformity with the approved Plans, Specifications, change orders, construction change documents, and as required by law. (See Title 24, Section 4-343)

3.1.3 All Work Under the Direction of Inspector

Pursuant to Title 24 requirements, the Contractor shall not carry on Work except with the knowledge of the Inspector (See Title 24 generally).

3.1.4 Contractor to Establish Timing and Protocol with Inspector

Contractor shall establish a protocol for requesting inspection with Inspector so as to not delay the Work and provide adequate time for the Inspector to perform inspection. If such a protocol is not established ahead of time, Inspector may utilize the time criteria set by Title 24 of 48 hours in advance of submitting form DSA 156 for each new area. DSA requirements under PR 13-01 specifically gives the

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Special Inspector fourteen (14) days to post to the DSA website. Contractor is responsible for delays and for failure to plan.

For some Projects, there may be a need to incrementally install certain assemblies. It is up to Contractor to identify areas and assemblies that may be constructed incrementally. Contractor must identify and establish incremental areas of construction and establish protocols with Inspector for DSA 152 approvals so they may be presented to DSA. See PR-13 item 1.17 for further discussion.

3.1.5 Verified Reports

The Contractor shall make and submit to the office from time to time, verified reports as required in Title 24 Section 4-366. As part of the Close-Out of the Project (see Article 9.9), Contractor shall be required to execute a Form 6-C as required under Title 24 Sections 4-343.

Contractor shall fully comply with any and all reporting requirements of Education Code sections 81147 et seq., in the manner prescribed by Title 24, as applicable.

3.1.6 Contractor Responsibility

The Contractor shall be responsible to the District for acts and omissions of the Contractor's employees, Subcontractors, material and equipment suppliers, and their agents, employees, invitees, and other persons performing portions of the Work under direct or indirect contract with the Contractor or any of its Subcontractors.

3.1.7 Obligations not Changed by Architect's Actions

The Contractor shall not be relieved of 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 other than the Contractor.

3.1.8 Acceptance/Approval of Work

The Contractor shall be responsible to determine when any completed portions of the Work already performed under this Contract or provided pursuant to Article 6 are suitable to receive subsequent Work thereon.

3.2 SUPERVISION

3.2.1 Full Time Supervision

Unless personally present on the Project site where the Work is being performed, the Contractor shall keep on the Work at all times during its progress a competent, English speaking construction Superintendent satisfactory to the District. The Superintendent shall be present on a full-time basis, shall be dedicated exclusively to the Project and shall not share superintendency duties with another project or job. The Superintendent shall not be replaced except with written consent of the District. The Superintendent shall represent the Contractor in its absence and shall be fully authorized to receive and fulfill any instruction from the Architect, the Inspector, the District or any other District Representative (including CM in the cases where the District has a CM representative). All Requests for Information shall be originated by the Superintendent and responses thereto shall be given to the Superintendent. No Work

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shall begin on any day by any Subcontractor or other person on the Project site until the Superintendent has arrived, or shall any Work continue during the day after the Superintendent has departed from the Project site. The Superintendent shall have authority to bind Contractor through the Superintendent's acts. The Superintendent shall represent the Contractor, and communications given to the Superintendent shall be binding on the Contractor. Before commencing the Work, Contractor shall give written notice to District (and CM representative) and Architect of the name and a Statement of Qualifications of such superintendent. Superintendent shall not be changed except with written consent of District, unless a superintendent proves to be unsatisfactory to Contractor and ceases to be in its employ, in which case, Contractor shall notify District and Architect in writing. Contractor shall provide a replacement superintendent approved by the District prior to performing additional work.

3.2.2 Staff

Notwithstanding other requirements of the Contract Documents, the Contractor and each Subcontractor shall: (1) furnish a competent and adequate staff as necessary for the proper administration, coordination, supervision, and superintendence of its portion of the Work; (2) organize the procurement of all materials and equipment so that the materials and equipment will be available at the time they are needed for the Work; and (3) keep an adequate force of skilled and fit workers on the job to complete the Work in accordance with all requirements of the Contract Documents.

3.2.3 Right to Remove

District shall have the right, but not the obligation, to require the removal from the Project of any superintendent, staff member, agent, or employee of any Contractor, Subcontractor, material or equipment supplier.

3.3 LABOR AND MATERIALS

3.3.1 Contractor to Provide

Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, material, equipment, tools, construction equipment and machinery, water, heat, air conditioning, utilities, transportation, and other facilities, services and permits 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.

3.3.2 Quality

Unless otherwise specified, all materials and equipment to be permanently installed in the Project shall be new and shall be of the highest quality or as specifically stated in the Contract Documents. The Contractor shall, if requested, furnish satisfactory evidence as to kind and quality of all materials and equipment within ten (10) days of a written request by the District, including furnishing the District with bona fide copies of invoices for materials or services provided on the Project. All labor shall be performed by workers skilled in their respective trades, and shall be of the same or higher quality as with the standards of other school construction.

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3.3.3 Replacement

Any work, materials, or equipment, which do not conform to these requirements or the standards set forth in the Contract Documents, may be disapproved by the District, in which case, they shall be removed and replaced by the Contractor at no additional cost or extension of time to the District.

3.3.4 Discipline

The Contractor shall enforce strict discipline and good order among the Contractor's and Subcontractor's employees, and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. As used in this subsection, "unfit" includes any person who the District concludes is improperly skilled for the task assigned to that person, who fails to comply with the requirements of this article, or who creates safety hazards which jeopardize other persons and/or property.

3.3.5 [NOT USED.]

3.3.6 Noise, Drugs, Tobacco, and Alcohol

Contractor shall take all steps necessary to insure that employees of Contractor or any of its Subcontractors' employees do not use, consume, or work under the influence of any alcohol, tobacco or illegal drugs while on the Project. Contractor shall further prevent any of its employees or its Subcontractor employees 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.

3.3.7 Delivery of Material

Contractor shall place orders for materials or equipment so that the Work may be completed in accordance with the Construction schedule for the Work as set forth in Article 8 of this Agreement. Contractor shall, upon demand from the Architect, furnish to the Architect documentary evidence including, but not limited to purchase orders, invoices, bills of materials, work orders and bills of lading, showing that orders have been placed. Contractor shall have a system to receive materials and to ensure that the proper materials are being delivered, including in the case of critical materials to the Project, checking the delivery against Shop Drawings and ensuring that the materials meet the requirements of not only the Plans and Specifications, but also the approved Shop Drawings and Submittals and in conformance with Contractor's plan for delivery of materials (including but not limited to Contractor's representations in the Schedules for the Project and Contractor's equipment and materials schedule under Article 3.7.2.2). Contractor shall be responsible for all costs of accepting non-conforming materials delivered to the Project given Contractor's responsibilities and system for acceptance of deliveries. Contractor shall notify Inspector and District Representative (including CM) as early as possible, in writing, of the delivery of materials for the Project. The deliveries shall include documentation identifying the shipment sufficiently so that the Inspector, Architect or District Representative (including CM) may review the materials that are received. Under no circumstances shall materials be delivered to the Project site that are meant for another Project.

3.3.8 Liens and Other Security Interests of Subcontractors and Material Suppliers

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No material, supplies, or equipment for the Work shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with all improvements and appurtenances constructed or placed thereon by it, to District free from any claims, security interests, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any Work covered by this Contract shall have any right to place a lien upon the premises or any improvement or appurtenance thereof, except that Contractor may install metering devices or other equipment of a utility company or political subdivision, title to which is commonly retained by the utility company or political subdivision. In event of installation of any such metering device or equipment, Contractor shall advise District as to its owner within five (5) days of such installation in writing, prior to making the installation.

Contractor agrees to indemnify, defend and hold the District harmless from any liens, stop notices, or assertion of security interests, including judgments and levies. If after written notice Contractor fails to address the lien, stop notice, or other security interest, the District may proceed to address the lien, stop notice or claim and seek reimbursement from Contractor.

3.3.9 Title to Materials

The title to new materials or equipment for the Work of this Contract shall remain with Contractor until incorporated in the Work of this Contract until final acceptance of the Project; no part of said materials shall be removed from its place of storage, and Contractor shall keep an accurate inventory of all said materials and equipment in a manner satisfactory to the District or its authorized representative. Responsibility for materials remains with Contractor and Contractor shall replace materials in case of loss. District similarly may pay for materials stored off site, but Contractor shall remain responsible for the materials that are stored off site.

3.3.10 Assemblies

For all material and equipment specified or indicated in the Drawings, the Contractor shall provide all labor, materials, equipment, and services necessary, (including engineering as specifically required with Shop Drawings or Deferred Approvals) for complete assemblies and complete working systems. Incidental items not indicated on the Drawings, nor mentioned in the Specifications, that can legitimately and reasonably be inferred to belong to the Work described, or be necessary in good practice to provide a complete assembly or system, shall be furnished as though itemized in the Contract Documents in every detail. In all instances, material and equipment shall be installed in strict accordance with each manufacturer's most recent published recommendations and Specifications.

3.3.11 Noise Control

The Contractor shall be responsible for the installation of noise reducing devices on construction equipment. Contractor shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. Construction equipment noise is subject to the control of the Environmental Protection Agency's Noise Control Program (Part 204 of Title 40, Code of Federal Regulations). If classes are in session at any point during the progress of the Project, and, in the District's reasonable discretion, the noise from such Work disrupts or disturbs the students or faculty or the normal operation of the campus, at the District's request, the Contractor shall schedule the performance of all such Work around normal campus hours or make other arrangements so that the Work does not cause such disruption or disturbance. There are specific periods of testing at

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operational campuses and it is critical that Contractor control noise during periods of testing. In no event shall Contractor have a right to receive additional compensation or an extension to the Contract time as a result of any such rescheduling or the making of such arrangements. These controls shall be implemented during site preparation and construction. All noise related issues, including campus operations, and noise during testing should be detailed in the Schedule provided pursuant to Article 8

3.4 WARRANTY

The Contractor warrants to the District and Architect that material and equipment furnished under the Contract will be of the highest quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Contractor's warranty to District includes, but is not limited to, the following representations:

3.4.1 In addition to any other warranties provided elsewhere, Contractor shall, and hereby does, warrant all Work after the date of Notice of Completion of Work by District and shall repair or replace any or all such Work, together with any other Work, which may be displaced in so doing that may prove defective in workmanship or materials within a one (1) year period from date of Final Completion which shall be no later than the final date of Punch List as noted at Article 9.11) without expense whatsoever to District, ordinary wear and tear, unusual abuse or neglect excepted. District will give notice of observed defects with reasonable promptness. Contractor shall notify District upon completion of repairs.

3.4.2 In the event of failure of Contractor to comply with above mentioned conditions within one week after being notified in writing, District is hereby authorized to proceed to have defects repaired and made good at expense of Contractor who hereby agrees to pay costs and charges therefore immediately on demand.

3.4.3 If, in the opinion of the District, defective Work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the District, the District will attempt to give the notice required by this Article. If the Contractor cannot be contacted or does not comply with the District's requirements for correction within a reasonable time as determined by the District, the District may, notwithstanding the provisions of this article, proceed to make such correction or attention which shall be charged against Contractor. Such action by the District will not relieve the Contractor of the guarantee provided in this Article or elsewhere in this Contract.

3.4.4 This Article does not in any way limit the guarantee on any items for which a longer warranty is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish District all appropriate guarantee or warranty certificates upon completion of the project.

3.5 TAXES

Contractor will pay all applicable Federal, State, and local taxes on all materials, labor, or services furnished by it, and all taxes arising out of its operations under the Contract Documents. District is exempt from Federal Excise Tax, and a Certificate of Exemption shall be provided upon request.

3.6 PERMITS, FEES AND NOTICES

3.6.1 Payment

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The Contractor shall secure and pay for all permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are necessary after execution of the Contract and are legally required by any authority having jurisdiction over the Project, except those required by the Division of the State Architect (DSA). District shall be responsible for all testing and inspection as required by the DSA on-site or within the distance limitations set forth in Article 13.5.2, unless a different mileage range is specified in the Supplemental Conditions.

3.6.1.1 *DSA Fees.* DSA policy is to charge CCD review fees for processing and approval of changes in the Plans and Specifications through the Construction Change Document process. Contractor is specifically directed to the current DSA IR A-30 which provides fee structure and charges that will be incurred for proceeding with respect to the CCD process, a process that must be followed for each change in the Plans and Specifications.

3.6.2 Compliance

The Contractor shall comply with and give notices required by any law, ordinance, rule, regulation, and lawful order of public authorities bearing on performance of the Work. Specifically, the Division of State Architect provides State oversight of the Project and enforcement of Title 24 rules and regulations. Contractor is directed to the DSA website. There will be local governmental oversight from City, County or both. Finally, Regional Water Quality Control Board, State Fire Marshall, local fire marshal, Department of Industrial Relations, Department of Labor Standards Enforcement, and Air Quality Management District (Local and State) are some of the agencies that provide oversight and may require specific permits, fees, or provide oversight over the Project. Contractor represents understanding and specialized knowledge of the rules governing community college districts and Contractor shall maintain compliance over the applicable rules and will file all documents required in order to ensure compliance with State, local, and other rules that apply to the Project.

3.6.3 Responsibility

The Contractor shall perform all Work in conformance with every law, statute, ordinance, building code, rule or regulation. The Contractor shall assume full responsibility for such Work and shall bear the attributable cost of correction or project delay.

Pursuant to Title 24 Section 4-343(b):

“Contractor shall carefully study the approved Plans and Specifications and shall plan a schedule of operations well ahead of time.... All inconsistencies or items which appear to be in error in the Plans and Specifications shall be promptly called to the attention of the architect or registered engineer, through the inspector, for interpretation or correction.”

To help Contractor plan its operations, Contractor is directed to study the current version of the DSA 152 Inspection Card Manual identifying the exact steps the Inspector is to follow in the review and sign off process for the DSA 152. The DSA 152 Inspection Card Manual provides specific detail as to the order of operations, review items and compliance items beyond the Specifications and Plans which are reviewed for DSA compliance. The most current version of this manual is located on DSA’s website.

Contractor is also specifically directed to the time periods for posting of Special Inspection Reports and Inspector Notifications under DSA PR 13-01 since the timing of Inspection is not a Governmental Entity related delay.

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3.7 SUBMITTALS REQUIRED AT THE COMMENCEMENT OF THE PROJECT

3.7.1 Requirements Within Ten (10) Calendar Days

Within ten (10) calendar days after Notice to Proceed, Contractor shall submit the following:

- 3.7.1.1 Detailed Schedule of Values (See Article 9.2)
- 3.7.1.2 Submittal Listing and Schedule for Submittals
- 3.7.1.3 Critical Path Baseline Schedule (See Article 8)

3.7.2 Requirements Within Thirty-Five (35) Calendar Days

Within thirty-five (35) calendar days after Notice to Proceed, Contractor shall submit the following:

3.7.2.1 *All Submittals for the Project* except those specifically agreed upon by District and Architect, in writing, and shall be specifically incorporated into the Submittal section of the Schedule so as to not delay the Work. The agreement to allow a later Submittal does not mean that Article 3.3.7 is waived. Contractor shall order materials and ensure prices are honored and secured for the Project.

- a. Structural Steel may be included as a later Submittal than 35 days if Structural Steel is a significant portion of the Work, at least one or some of the Project is a structural steel structural system, or as specifically agreed upon by the Architect or District.
- b. It is specifically agreed that submissions of structural steel Submittals shall not be piecemeal (unless some portion is requested separately by the District or Architect), shall provide complete designs, shall be stamped by the structural steel Subcontractor, Contractor, and structural steel Subcontractor's structural engineer at time of submission and as further addressed in Article 3.9.
- c. In no case shall the submission of structural steel Drawings delay the critical path for the schedule. If a Milestone is provided for submission of complete structural steel Shop Drawings then the date shall be no later than as set forth in the Milestone

3.7.2.2 *Exceptions to Submittal Within Thirty-Five (35) Days by Written Agreement.* A written request detailing the specific reasons for a submission later than 35 days due to complexity of design or non-critical path status of the Submittal shall be submitted at the time the Baseline Schedule is submitted. The Baseline Schedule shall not include a delayed Submittal until written agreement is provided. In addition to the request for providing a Submittal after the thirty-five (35) day period, a copy of the Contract with the Subcontractor who shall be performing the Submittal, a written statement from the Subcontractor verifying that work has commenced on the Submittal and providing Subcontractor's own schedule of Milestones and completion dates, and a corresponding Submittal designation in the Schedule as required under Article 8. Approval of a delayed Submittal shall not result in any increase in the Contract Price or result in an extension of time for the completion of the Project.

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3.7.2.3 *Piecemeal Submissions of Submittals.* Piecemeal Submittals mean providing portions of Shop Drawings or Submittals as they are being completed. The submission of piecemeal Submittals results in the appearance of a submission when there is inadequate information for the Architect or Engineer to adequately review a submission. Piecemeal differs from submission of complete buildings or phases of buildings or complete assemblies. The Architect may agree to allow submission of single buildings or areas as long as the Submittals are complete. .

3.8 DOCUMENTS, SAMPLES, AND COMPUTER AT THE SITE

The Contractor shall maintain at the Site for the District one current copy of the California Building Code, Titles 19 and 24 of the California Code of Regulations, any other document required by DSA, and one record copy of the Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and marked currently to record changes and selections made during construction. In addition, the Contractor shall maintain at the Site approved Shop Drawings, Product Data, Samples, and similar required Submittals. These documents shall be available to the Architect and shall be delivered to the Architect for delivery to the District upon completion of the Work.

Contractor shall have an operational computer with internet access so Contractor can review and post documents as required for the Project, including but not limited to the filing and posting of DSA required documents for the Project.

Contractor shall be prepared to review documents posted to the DSA Project website.

3.9 SUBMITTALS INCLUDING SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3.9.1 Definitions

3.9.1.1 *Deferred Approvals.* Approval of certain aspects of the construction may be deferred until the construction Contract has been awarded. To facilitate the design process, DSA grants Deferred Approval to the design and detailing of certain elements of the Project at the request of the Architect or Engineer of Record. Design elements that may be deferred may include, but are not limited to access floors, bleachers, elevator guide rails and related elevator systems, exterior wall systems - precast concrete, glass fiber reinforced concrete, etc., skylights, window wall systems, storefronts, stage rigging, and other systems as noted in the Contract Documents. (Also see Article 1.2.2 and 3.9.3)

3.9.1.2 *Shop Drawings.* The term “Shop Drawings” as used herein means Drawings, diagrams, equipment or product schedules, and other data, which are prepared by Contractor, Subcontractors, manufacturers, suppliers, or distributors illustrating some portion of the Work, and includes: illustrations; fabrication, erection, layout and setting Drawings; manufacturer’s standard Drawings; schedules; descriptive literature, instructions, catalogs, and brochures; performance and test data including charts; wiring and control diagrams; and all other Drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment, or systems and their position conform to the requirements of the Contract Documents.

3.9.1.3 *Manufactured* applies to standard units usually mass-produced, and “Fabricated” means items specifically assembled or made out of selected materials to meet individual design requirements. Shop Drawings shall: establish the actual detail of all manufactured or Fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical

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systems and equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions.

3.9.1.4 *Submittals* is a term used interchangeably and sometimes refers to Shop Drawings, Product Data, and samples since all Subcontractor submissions are tracked in a Submittal Log and may include any of the noted items. However, generally, a Submittal is a manufacturer's product information and Product Data including description, characteristics, size, physical characteristics, and requirements to prepare the jobsite for receiving of the particular manufactured item.

3.9.1.5 *Samples*. The term "samples" as used herein are physical examples furnished by Contractor to illustrate materials, equipment, or quality and includes natural materials, Fabricated items, equipment, devices, appliances, or parts thereof as called for in the Specifications, and any other samples as may be required by the Architect to determine whether the kind, quality, construction, finish, color, and other characteristics of the materials, etc., proposed by the Contractor conform to the required characteristics of the various parts of the Work. All Work shall be in accordance with the approved samples.

3.9.2 Shop Drawings.

3.9.2.1 *When Shop Drawings Are Required*. Shop Drawings are required for prefabricated components and for installation and coordination of these prefabricated components into the Project. In addition, Shop Drawings, are prepared to address the actual size and installation of components from various Subcontractors and provides an opportunity for the Contractor to coordinate and address conflicts between the subcontracting trades. In some cases, each Subcontractor or trade will provide Shop Drawings in a BIM format or other format as agreed by District.

3.9.2.2 *Purpose for Shop Drawings*. Shop Drawings are the Contractor's manufacturer, Subcontractor, supplier, vendor or the Contractor's detailed drawings showing particularized method for assembly, specifics to a manufacturer, manufacturer component installation requirements, specifics as to a manufactured item, alterations to a manufactured, a custom created item, or drawn version of more detailed information expanding on the Architect's design shown in the Contract Documents. The Shop Drawings address the appearance, performance, size, weight, characteristics and prescriptive descriptions associated with the Contractor or Contractor's Subcontractor's plan for installation or assembly based on the design in the Specifications and Contract Documents. The Shop Drawing often is more detailed than the information shown in the Contract Documents to give the Architect and Engineer the opportunity to review the fabricator's version of the product (along with particulars specific to that particular product), prior to fabrication. References to the Contract Documents, Construction Documents, Drawings, Plans, and Specifications assist the Architect and Engineer in their review of the Shop Drawings. Attachment of manufacturer's material Specifications, "catalog cut sheets," and other manufacturer's information may be provided to accompany Shop Drawings. Because Shop Drawings facilitate the Architect's and Engineer's approval of the system, they should be as clear and complete as possible so they may be reviewed by Architect or Engineer for the Project.

3.9.2.3 *Shop Drawing Requirements*. The Contractor shall obtain and submit with Shop Drawings all seismic and other calculations and all Product Data from equipment manufacturers. "Product Data" as used herein are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

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3.9.2.4 *Not a Reproduction of Architectural or Engineering Drawings.* The Shop Drawings are not a reproduction of the architectural or engineering Drawings. Instead, they must show more detail than the Construction Documents and details the fabrication and/or installation of the items to the manufacturer's production crew or Contractor's installation crews.

3.9.2.5 *Shop Drawings Engineering Requirements:* Some Shop Drawings require an engineer stamp to be affixed on the Drawings and calculations. In such cases, a current and valid engineering stamp shall be affixed by a California registered engineer. No out of State engineers shall stamp Shop Drawings. (See DSA IR A-18). In most cases, an engineer means California registered mechanical, structural, electrical or plumbing engineer. California Registered Civil Engineers will not be accepted for structural details unless specifically approved by DSA.

3.9.2.6 *DSA Approvals Required Prior to Work.* No work on a Shop Drawing that requires DSA approval may proceed until DSA approval is received. Contractor has provided DSA approval time and allowed adequate time for corrections in Contractor's Schedule as required pursuant to Article 8.

3.9.2.7 *Shop Drawing Identification.* All Shop Drawings must be properly identified with the name of the Project and dated, and accompanied by a letter of transmittal referring to the name of the Project and to the Specification section number for identification of each item clearly stating in narrative form, as well as "clouding" all qualifications, departures, or deviations from the Contract Documents. Shop Drawings, for each section of the Work shall be numbered consecutively and the numbering system shall be retained throughout all revisions. All Subcontractor submissions shall be made through the Contractor. Each drawing shall have a clear space for the stamps of Architect and Contractor.

3.9.3 Deferred Approvals

Deferred approvals shall be submitted and processed to ensure all DSA and other governmental approvals are secured so as to not delay the Project. There may be additional requirements for Deferred Approvals at Division 1 of the Specifications. All Deferred Approvals shall be prepared by Contractor or Contractor's agent early enough so as to not delay the Project. Contractor is aware that Title 24 California Code of Regulations Section 4-317 have specific requirements for Deferred Approval as to governing agencies and as to the Architect and Engineer for the Project. As a result, any delay associated with the time for approval by applicable agencies or by the Architect or Architect's consultants shall be Contractor's. Contractor is required to comply with inclusion of Deferred Approvals in the Schedule as required under Article 3.9.6

3.9.3.1 *DSA Approvals Required Prior to Work.* No work on a Deferred Approval item may proceed on the components until DSA approval is received. Contractor has provided DSA approval time and allowed adequate time for any DSA revisions in Contractor's Schedule as required pursuant to Article 8.

3.9.4 Submittals and Samples

3.9.4.1 *Information Required With Submittals:* Manufacturer, trade name, model or type number and quantities: Information provided must be of sufficient detail to allow Architect and Engineer to compare the submitted item with the specified products and acceptable products listed, in the Specifications and addenda.

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3.9.4.2 *Description of Use and Performance Characteristics:* Information should be furnished describing the normal use and expected performance of the product. The Architect and Contractor review this information to confirm that the product is appropriate for the intended use.

3.9.4.3 *Size and Physical Characteristics:* The size and physical characteristics, such as adjustment capabilities, which is reviewed by both the Contractor and Architect. The Contractor has the most available information for comparing adjoining materials and equipment. The Contractor also needs to know the size and weight of the equipment for lifting and handling considerations.

3.9.4.4 *Finish Characteristics:* The Architect reviews the available finishes and selects the appropriate finish, if the finish was not previously specified in the documents. The Contractor should confirm that finish requirements in the Specifications are being met by the product.

3.9.4.5 *Contractor Responsible for Jobsite Dimensions:* Some material is custom-fabricated to job conditions, requiring dimensions from the jobsite. These jobsite dimensions are provided by the Contractor as part of the Contractor's responsibilities for the Project and shall be provided prior to release of the product for manufacture. Contractor shall not rely on Architect or Engineers to provide jobsite dimensions.

3.9.4.6 *Full Range of Samples Required (When Specific Items Not Specified).* Except in cases where the exact color and type of item is specified since the District is utilizing items Standardized or pre-selected by District, the full range of color, graining, texture, or other characteristics are anticipated for review in finished products, a sufficient number of samples of the specified materials shall be furnished by the Contractor to indicate the full range of characteristics which will be present in the finished products. Products delivered or erected without Submittal and approval without providing a full range of samples shall be subject to rejection. Except for range samples, and unless otherwise called for in the various sections of the Specifications or Specification Section 1, samples shall be submitted in duplicate.

3.9.4.7 *Labeling of Samples.* All samples shall be marked, tagged, or otherwise properly identified with the name of the submitting party, the name of the Project, the purpose for which the samples are submitted and the date.

3.9.4.8 *Transmittal letter.* All samples shall be accompanied by a letter of transmittal containing similar information, together with the Specification section number.

3.9.4.9 *Labels and Instructions.* All samples of materials shall be supplied with the manufacturer's descriptive labels and application instructions. Each tag or sticker shall have clear space for the review stamps of Contractor and Architect.

3.9.4.10 *Architect's Review.* The Architect will review and, if appropriate, approve submissions and will return them to the Contractor with the Architect's stamp and signature applied thereto, indicating the timing for review and appropriate action in compliance with the Architect's (or District's) standard procedures. In the cases where a CM is hired by the District, CM may be the party that receives and performance logging and initial processing of the Samples. CM may, in some cases, reject samples that are not in conformance with Contract requirements.

3.9.5 Submittal Submission Procedure

3.9.5.1 *Transmittal Letter and Other Requirements.* All Submittals must be properly identified with the name of the Project and dated, and each lot submitted must be accompanied by

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a letter of transmittal referring to the name of the Project and to the Specification section number for identification of each item clearly stating in narrative form, as well as “clouding” on the submissions, all qualifications, departures, or deviations from the Contract Documents. Shop Drawings, for each section of the Work shall be numbered consecutively and the numbering system shall be retained throughout all revisions. All Subcontractor submissions shall be made through the Contractor. Each drawing shall have a clear space for the stamps of Architect and Contractor. Refer to Division 1. In the case where a CM is hired on the Project, the CM may be designated to receive the Submittals for the Project, log the Submittals, and in some cases reject Submittals that do not conform to Contract requirements. Submittal Procedures for further information.

3.9.5.2 *Copies Required.* Each Submittal shall include one (1) legible, reproducible (if electronic is available, electronic copies shall also be provided) and five (5) legible prints of each drawing or schedule, table, cut sheet, etc., including fabrication, erection, layout and setting drawings, and such other drawings as required under the various sections of the Specifications, until final acceptance thereof is obtained. Subcontractor shall submit copies, in an amount as requested by the Contractor, of: (1) manufacturers’ descriptive data for materials, equipment, and fixtures, including catalog sheets showing dimensions, performance, characteristics, and capacities; (2) wiring diagrams and controls; (3) schedules; (4) all seismic calculations and other calculations; and (5) other pertinent information as required by the District or Architect. See also Division 1.

3.9.5.3 *Corrections.* The Contractor shall make all corrections required by Architect, District or CM and shall resubmit, as required by Architect or CM, corrected copies of Shop Drawings or new samples until approved. Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections required by the Architect on previous submissions. Professional services required for more than one (1) re-review of required Submittals of Shop Drawings, Product Data, or samples are subject to charge to the Contractor pursuant to Article 4.5.

3.9.5.4 *Approval Prior to Commencement of Work.* No portion of the Work requiring a Shop Drawing or sample submission or other Submittal shall be commenced until the submission has been reviewed by Contractor and Architect (and CM, if applicable) and approved by Architect (and CM where applicable) unless specifically directed in writing by the Architect. All such portions of the Work shall be in accordance with approved Shop Drawings and samples.

3.9.5.5 *District’s Property.* All Submittals, Shop Drawings, computer disks, BIM modeling information, clash checks, schedules, annotated Specifications, samples and other Submittals shall become the District’s property upon receipt by the District or Architect.

3.9.6 Schedule Requirements for Submittals

Contractor shall obtain and shall submit all required Submittals (i.e. Shop Drawings, Deferred Approvals, Samples, etc.), in accordance with Contractor’s “Schedule for Submission of Shop Drawings and Samples” as required in the scheduling portion of the General Conditions at Articles 8 and the Specifications (as long as the Specifications do not conflict with General Conditions. In the case of conflict, the conflicting provision shall be controlled by the General Conditions and the remaining Specifications sections shall be interpreted as if the general conditions language is inserted) with such promptness as to cause no delay in its own Work or in that of any other contractor or subcontractor but in no event later than thirty five (35) days after the Notice to Proceed is issued except in the specific cases noted as an exception under Article 3.7.2.1. No extensions of time will be granted to Contractor or any Subcontractor because of its failure to have Shop Drawings and samples submitted in accordance with Division 1 and the Schedule. Each Subcontractor shall submit all Shop Drawings, samples, and

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manufacturer's descriptive data for the review of the District, the Contractor, and the Architect through the Contractor.

3.9.6.1 *Consideration of Schedule.* Contractor has considered lead times, DSA or other agency governmental review times, Architect or Engineer review times, manufacturing seasons, and specific long lead procurement concerns for all submittals for the Project.

3.9.7 General Submittal Requirements

3.9.7.1 *Contractor Submittal Representations and Coordination.* By submitting Shop Drawings, Product Data, samples, etc., the Contractor represents that it has determined and verified all materials, field measurements, catalog numbers, related field construction criteria, and other relevant data in connection with each such submission, and that it has checked, verified, and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents, including the construction schedule.

3.9.7.2 *Contractor Coordination.* Contractor shall stamp, sign, and date each Submittal indicating its representation that the Submittal meets all of the requirements of the Contract Documents and evidence Contractor's review through execution of the following stamp to be placed on each Shop Drawings:

“[Contractor] has reviewed and approved the field dimensions and the construction criteria, and has also made written notation regarding any information in the Shop Drawings and Submittals that does not conform to the Contract Documents. This Shop Drawing or Submittal has been coordinated with all other Shop Drawings and Submittals received to date by me as Contractor and this duty of coordination has not been delegated to Subcontractors, material suppliers, the Architect, or the Engineers on this Project.

Signature of Contractor and date

3.9.7.3 *No Deviation from Contract Documents.* The submission of the Shop Drawings, Product Data, samples, etc., shall not deviate from the *requirements* of the Contract Documents including detailing and design intent which is specifically outlined in Contract Documents except as specifically authorized by the Architect or through an accepted substitution pursuant to Article 3.10.4. All deviations from the Contract Documents shall be narratively described in a transmittal accompanying the Shop Drawings. However, Shop Drawings shall not be used as a means of requesting a substitution, the procedure for which is defined in Article 3.10.4, “Substitutions.”

3.9.7.4 *Contractor Responsibility for Shop Drawings Conformance to Contract Documents.* Review by District and Architect shall not relieve the Contractor or any Subcontractor from its responsibility in preparing and submitting proper Shop Drawings in accordance with the Contract Documents.

3.9.7.5 *Incomplete Submittals.* Any submission, which in Architect's opinion is incomplete, contains errors, or has been checked superficially, will be returned not reviewed by the Architect for resubmission by the Contractor. Refer to Submittal Procedures of the Specifications for additional information. The Contractor shall be responsible for any related delays and shall not be the basis for any Claim.

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3.9.7.6 *Shop Drawings and Submittals Shall Not Be Used as a Method to Make a Substitution.* Shop Drawings and Submittals shall not be used as a means of requesting a substitution or to make changes in the Contract Documents. If changes are made to the Contract Documents through the Shop Drawings, the Architect shall have the right to reject the Submittal. If the Architect does not note the deviation from the approved Plans and Specifications, the Contractor is still responsible for the change and the Architect or the District may require the Shop Drawings be revised to properly reflect the approved Contract Documents. The Architect or District may also require that the Contractor bear all costs under Article 4.5 and consequential damages associated with a CCD to revise Plans and Specifications to accommodate the deviation from approved Plans and Specifications.

3.9.7.7 Extent of Review. In reviewing Shop Drawings, the Architect will not verify dimensions and field conditions. The Architect will review and approve Shop Drawings, Product Data, samples, etc., for aesthetics and for conformance with the design concept of the Work and the information in the Contract Documents. The Architect's review shall neither be construed as a complete check which relieves the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called the Architect's attention to the deviations at the time of submission. The Architect's review shall not relieve the Contractor or Subcontractors from responsibility for errors of any sort in Shop Drawings or schedules, for proper fitting of the Work, coordination of the differing Subcontractor trades and Shop Drawings and Work which is not indicated on the Shop Drawings at the time of submission of Shop Drawings. Contractor and Subcontractors shall be solely responsible for any quantities which may be shown on the Submittals or Contract Documents.

3.10 SUBSTITUTIONS

3.10.1 Definition

A Substitution is a change in product, material, equipment, or method of construction from those required by the Construction Documents proposed by the Contractor. For this Project, a Substitution is subject to the filing of a Construction Substitution Request Form at the time of bid and meeting the requirements of this Article.

3.10.2 One Product Specified

Unless the Specifications state that no substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction or any specific 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 the material, process, or article desired and shall be deemed to be followed by the words "or equal." Subject to the requirements of properly submitting a Substitution Request for as Addressed in Article 3.10.4, the Contractor may, unless otherwise stated, offer any material, process, article, etc., which shall be materially equal or better in every respect to that so indicated or specified ("Specified Item") and will completely accomplish the purpose of the Contract Documents.

3.10.3 Products Specified Which Are Commercially Unavailable

If the Contractor fails to make a request for substitutions for products, prior to the submission of its bid, and such products subsequently become commercially unavailable, the Contractor may request a substitution for such commercially unavailable item. The decision to grant this request is solely at the District's discretion. The written approval of the District, consistent with the procedure for

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Change Orders, shall be required for the use of a proposed substitute material. The District may condition its approval of the substitution upon the delivery to District of an extended warranty or other assurances of adequate performance of the substitution as well as an equitable deduction in the Contract Price should the substituted item cost less than the Specified Item. All risks of delay due the approval of a requested substitution by the DSA, or any other governmental agency having jurisdiction, shall be on the requesting party. All additional costs, DSA review costs, all procurement and construction delays, and all costs for review by the Architect or its consultants shall be the responsibility of the Contractor and will be deducted from Contractor's pay request.

3.10.4 Substitution Request Form

Requests for substitutions of products, materials, or processes in place of a Specified Item must be in writing on the District's Substitution Request Form ("Request Form") at the time of submitting bids to the District, except as provided for in Article 3.10.3.

The Request Form must be accompanied by evidence as to whether the proposed substitution:

- a. Is equal in quality/service/ability to the Specified Item;
- b. Will entail no changes in detail, construction, and scheduling of related work;
- c. Will be acceptable in consideration of the required design and artistic effect;
- d. Will provide no cost disadvantage to the District;
- e. Will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts; and
- f. Will required no change of the construction schedule.

In completing the Request Form, the bidder must state, with respect to each requested substitution, whether the bidder will agree to provide the Specified Item in the event that the District denies the bidder's request for such requested substitution. In the event that the bidder has agreed in the Request Form to provide the Specified Item and the District denies the bidder's requested substitution for a Specified Item, the bidder shall provide the Specified Item without any additional cost or charge to the District.

After bids are opened, the apparent lowest bidder shall provide, within five (5) days of opening such bids, any and all Drawing, Specifications, samples, performance data, calculations, and other information, as may be required to assist the Architect, CM and the District in determining whether the proposed substitution is acceptable. The burden of establishing these facts shall be upon the bidder.

After the District's receipt of such evidence by the bidder, the District will make its final decision as to whether the bidder's request for substitution for any Specified Items will be granted. The decision as to whether a proposed request for substitution is equal to a Specified Item shall be at the sole discretion of the District. Any request for substitution that is granted by the District shall be documented and processed though a Change Order. Contractor must submit a complete Submittal of the requested substitution and a Shop Drawing showing configuration, dimensions, and other critical information associated with the substitution that meets the requirements of Article 3.9. The District may condition its approval of any substitution upon delivery to the District of an extended warranty or other assurances of

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adequate performance of the substitution. Any and all risks of delay due to approval by the DSA or any other governmental agency having jurisdiction shall be on the bidder.

If the Architect and District accept a proposed substitution, the Contractor agrees to pay for all DSA review costs, engineering and design services, including, without limitation, compensation to the Architect and affected engineers for their required time to process such substitution through the Division of the State Architect, if required, and to make all changes and adjustments in materials or the work of all trades directly or indirectly affected by the substituted item or items at no cost to the District.

3.10.5 Substitution Requests After Bid

The District, in its sole discretion, may accept a request for substitution by the Contractor or may request Contractor substitute a specified item. Any substitutions requested after bids are opened shall be subject to the same conditions and requirements set forth in Article 3.10.4 above. If any substitutions, that in the District or Architect's determination, results in a credit to the District, the credit amount shall be agreed upon in writing, otherwise, the request for substitution shall be deemed denied.

3.11 INTEGRATION OF WORK

3.11.1 Scope

The Contractor shall be responsible for cutting, fitting, or patching to complete the Work and to make all parts fit together properly. Contractor shall be responsible for ensuring that all trades are coordinated and scheduled so as to ensure the timely and proper execution of the work. When modifying existing work or installing new Work adjacent to existing work, Contractor shall match, as closely as conditions of Site and materials will allow, the finishes, textures, and colors of the original work, refinishing existing work at no additional cost to District. All cost caused by defective or ill-timed work shall be borne by Contractor. Contractor shall be solely responsible for protecting existing work on adjacent properties and shall obtain all required permits for shoring and excavations near property lines.

3.11.2 Structural Members

New or existing structural members and elements, including reinforcing bars and seismic bracing, shall not be cut, bored, or drilled except by written authority of the Architect. Work done contrary to such authority is at the Contractor's risk and subject to replacement at its own expense without reimbursement under the Contract. Schedule delays resulting from Agency approvals for unauthorized work shall be the Contractor's responsibility.

3.11.3 Subsequent Removal

Permission to patch any areas or items of the Work shall not constitute a waiver of the District's or the Architect's right to require complete removal and replacement of the areas or items of the Work if, in the opinion of the Architect or the District, the patching does not satisfactorily restore quality and appearance of the Work or does not otherwise conform to the Contract Documents.

3.12 CLEANING UP

3.12.1 Contractor's Responsibility to Clean Up

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Contractor at all times shall keep premises free from debris such as waste, dust, excess water, storm water runoffs, rubbish, and excess materials and equipment. Contractor shall not leave debris under, in, or about the premises, but shall promptly remove same from the premises and dispose of it in a lawful manner. Disposal receipts or dump tickets shall be furnished to the Architect within five (5) days of request.

Contractor shall remove rubbish and debris resulting from the Work on a daily basis. Contractor shall maintain the structures and Site in a clean and orderly condition at all times until acceptance of the Project by the District. Contractor shall keep its access driveways and adjacent streets, sidewalks, gutters and drains free of rubbish, debris and excess water by cleaning and removal each day. All concrete, sidewalks, and paths of travel shall be broom cleaned daily.

3.12.2 General Final Clean-Up

Upon completion of Work, Contractor shall employ experienced workers or professional cleaners for final cleaning. Contractor shall clean each surface to the condition expected in a normal, commercial, building cleaning and maintenance program including, but not limited to, the performance of the following:

- a. Clean interior and exterior of buildings, including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected, so surfaces are free from foreign material or discoloration;
- b. Clean the Project site. The grounds should be cleared of any Contractor equipment, raked clean of debris and trash removed. Sweep paved areas broom clean;
- c. Repair or replace any damaged materials. Replace any chipped or broken glass;
- d. Remove any and all stains;
- e. Remove labels that aren't permanent labels;
- f. Clean and polish all glass, plumbing fixtures, equipment, finish hardware and similar finish surfaces. Remove any glazing compounds;
- g. Remove temporary utilities, fencing, barricades, planking, sanitary facilities and similar temporary facilities from Site;
- h. Remove temporary film that remains on any hardware, doors or other surfaces; and
- i. Seal the bottom and tops of all doors.

3.12.3 Special Clean-Up.

In addition to the general cleaning, the following special cleaning shall be done at the completion of the Work in accordance with the Specifications including, but not limited to:

- a. Remove putty stains from glazing, then wash and polish glazing;

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- b. Remove marks, stains, fingerprints and other soil or dirt from painted, stained or decorated work;
- c. Remove temporary protection and clean and polish floors and waxed surfaces;
- d. Clean and polish hardware and plumbing trim; remove stains, dust, dirt, plaster and paint;
- e. Wipe surfaces of mechanical and electrical equipment.;
- f. Remove spots, soil, plaster and paint from tile work, and wash tile;
- g. Clean all fixtures and equipment, remove excess lubrication, clean light fixtures and lamps, polish metal surfaces;
- h. Vacuum-clean carpeted surfaces; and
- i. Remove debris from roofs, down spout and drainage system.

3.12.4 Failure to Cleanup

If the Contractor fails to clean up as provided in the Contract Documents, the District may do so, and the cost thereof shall be the responsibility of the Contractor pursuant to Article 2.2 and seek a Deductive Change Order.

3.13 ACCESS TO WORK

The Contractor shall provide the District, the Architect, Engineers and the Inspector of Record, access to the Work in preparation and progress wherever located. Contractor shall provide safe and proper facilities for such access so that District's representatives may perform their functions.

CONTRACTOR IS AWARE THAT THIS CONTRACT MAY BE SPLIT INTO SEVERAL PHASES AS ADDRESSED IN ARTICLE 6.

3.13.1 Special Inspection, Inspections or Tests Out of State, Out of Country or Remote from Project

If Contractor has a Subcontractor or supplier that requires in plant or special inspections or inspections or tests that are out of the country, out of the state, or a distance of more than 200 miles from the Project site, the Special Inspector or Inspector shall be provided access so the special inspection or inspection may occur in the remote location. In some cases, the DSA Inspector may also require access in addition to Special Inspectors and individuals performing tests. Inspections/tests shall occur during normal work hours. See also Article 4.3.6.

3.14 ROYALTIES AND PATENTS

3.14.1 Payment and Indemnity for Infringement

Contractor shall hold and save the District and its officers, agents, and employees, the Construction Manager, the Architect, and the Architect's consultants harmless from liability of any nature

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or kind, including cost and expense, for or on account of any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the District, unless otherwise specifically provided in the Contract Documents, and unless such liability arises from the sole negligence, or active negligence, or willful misconduct of the District, the Architect, or the Architect's consultants.

3.14.2 Review

The review by the Architect of any method of construction, invention, appliance, process, article, device, or material of any kind shall be for its adequacy for the Work and shall not be an approval for the use by the Contractor in violation of any patent or other rights of any person or entity.

3.15 INDEMNIFICATION

3.15.1 Contractor

See Agreement Form. Contractor shall ensure that its contract with each of its Subcontractors contains provisions requiring the Subcontractors to defend, indemnify and hold harmless the District, Architect, Inspector, the State of California to a minimum level as set forth in this Article and consistent with the indemnity and hold harmless language in the Agreement Form.

The Contractor's and Subcontractors' obligation to defend, indemnify and hold harmless the District, Architect, Inspector, the State of California and their officers, employees, agents and independent contractors hereunder shall include, without limitation, any and all claims, damages, and costs for the following: (1) any damages or injury to or death of any person, and damage or injury to, loss (including theft), or loss of use of, any property; (2) breach of any warranty, express or implied; (3) failure of the Contractor or Subcontractors to comply with any applicable governmental law, rule, regulation, or other requirement; (4) products installed in or used in connection with the Work; and (5) any claims of violation of the Americans with Disabilities Act ("ADA")

3.16 SUBMISSION OF DAILY REPORTS

3.16.1 General

By 10:00 a.m. on the following business day, the Contractor shall submit a Daily Report to the Inspector and copy the Architect for the previous day's Work. If there is a Construction Manager, the original Daily Report is to be provided to the Construction Manager and copies sent to the Architect and the Inspector. Daily Reports shall be prepared on forms approved by the District, together with applicable delivery tickets, listing all labor, materials, and equipment involved for that day. The District reserves the right to note inconsistencies or inaccuracies in the Daily Reports. In such cases, pertinent notes shall be entered by each party to explain points which cannot be resolved that day. Each party shall retain a signed copy of the report. Daily Reports by Subcontractors or others shall be submitted through the Contractor.

3.16.2 Labor

The Daily Report shall show names of workers, classifications, hours worked and hourly rate. The locations where work occurred shall also be identified in the Daily Report. Project superintendent expenses are not allowed.

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3.16.3 Materials

The Daily Report required shall describe and list quantities of materials used and unit costs.

3.16.4 Equipment

The Daily Report required shall show type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable, and hourly/daily cost. Move-on and move-off fees shall be noted.

3.16.5 Other Services and Expenditures

Other services and expenditures shall be described in the Daily Report in detail as the District requires.

3.16.6 Failure to Submit Daily Report

If Contractor does not submit its Daily Report by 10 am the next business day, the Inspector of Record shall prepare a Daily Report addressing each of the above items. The cost for the Inspector's services to prepare the Daily Report shall be addressed through a Deductive Change Order under Article 7.7.4.

3.17 AS-BUILT DRAWINGS AND ANNOTATED SPECIFICATIONS

Throughout the duration of the Project, Contractor shall maintain on a current basis an accurate and complete set of As-Built Drawings (and Annotated Specifications) clearly showing all changes, revisions to Specifications and substitutions during construction, including, without limitation, field changes and the final location of all electrical and mechanical equipment, utility lines, ducts, outlets, structural members, walls, partitions, and other significant features. In case a Specification allows Contractor to elect one of several brands, makes, or types of material or equipment, the annotations shall show which of the allowable items the Contractor has furnished. The Contractor will update the As-Built Drawings and Annotated Specifications as often as necessary to keep them current, but no less often than weekly.

Contractor shall update As-Built Drawings with complete information on an area of Work at or near the time when the Work is being performed and prior to any DSA 152 sign off and prior to any Work being covered.

The As-Built Drawings and Annotated Specifications shall be kept at the Site and available for review and inspection by the District and the Architect. Failure to maintain and update the As-Built Drawings is a basis to withhold Progress Payments pursuant to Article 9.6.

3.17.1 Upon Beneficial Occupancy

Contractor shall obtain and pay for reproducible Plans upon Beneficial Occupancy. Contractor shall deliver Plans to District Representative (Construction Manager if one is hired for the Project).

3.17.2 As-Built at Completion of Work

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Upon completion of the Work and prior to and as a condition precedent to Application for Retention Payment, the Contractor will provide one neatly prepared and complete set of As-Built Drawings and Annotated Specifications to the District. Contractor shall certify the As-Built Drawings as a complete and accurate reflection of the actual construction conditions of the Work by affixing a stamp indicating the Drawings are As-Built Drawings and certifying accuracy on the final set of As-Built Drawings. Failure to deliver a complete As-Built set of Drawings may result in significant withholdings to ensure Work is properly documented. See Article 9.9.1.

3.17.3 Log of Control and Survey Documentation

Contractor shall complete and maintain an accurate log or all control and survey documentation for the Project as the Work progresses. All reference and control points shall be recorded on the As-Built Drawings. The basis of elevations shall be one of the established benchmarks that must be maintained on the As-Built Drawings.

3.17.4 Record Coordinates for Key Items

Contractor shall record, by coordinates, all utilities on-site with top of pipe elevations, major grade and alignment changes, rim, grate or top of curb and flow line elevations of all drainage structures and sewer manholes. Contractor shall update record information at or near the time when work is occurring in an area and prior to DSA 152 sign off on any category of Work and prior to covering the Work.

3.17.5 BIM As-Built Drawings

If BIM is utilized for the Project, then an electronic version of such As-Built Drawings and Annotated Specifications will be delivered to District (in an acceptable format to District).

3.18 EQUIPMENT MANUALS

Contractor shall obtain and furnish three (3) complete sets of manuals containing the manufacturers' instructions for maintenance and operation of each item of equipment and apparatus furnished under the Contract Documents and any additional data specifically requested under the various sections of the Specifications for each division of the Work. The manuals shall be arranged in logical, sequential order, labeled, indexed, and placed in three-ring binders. At the completion of its Work, the Contractor shall certify, by endorsement thereon, that each of the manuals is complete, accurate, and covers all of its Work. Prior to submittal of Contractor's Application for Retention Payment, and as a further condition to its approval by the Architect, each Subcontractor shall deliver the manuals, arranged in logical, sequential order, labeled, indexed, endorsed, and placed in three-ring binders, to the Contractor, who shall assemble these manuals for all divisions of the Work, review them for completeness, and submit them to the District through the Architect.

3.19 DIR REGISTRATION

Strict compliance with all DIR registration requirements in accordance with Labor Code sections 1725.5 and 1771.1 is a material obligation of the Contractor and all of its subcontractors (of any tier) under the Contract Documents. The foregoing includes, without limitation, compliance with DIR registration requirements at all times during performance of the Work by the Contractor and all of its subcontractors of any tier. The failure of the Contractor and all subcontractors of any tier to be properly registered with DIR

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at all times during performance of the Work is a material breach of the Contract and subject to termination for cause.

An affirmative and ongoing obligation of the Contractor under the Contract Documents is the verification that all subcontractors of any tier are at all times during performance of the Work are in full and strict compliance with the DIR registration requirements. The Contractor shall not permit or allow any subcontractor of any tier to perform any Work without the Contractor's verification that all subcontractors are in full and strict compliance with the DIR registration requirements. Any subcontractors of any tier not properly registered with DIR shall be substituted in accordance with Labor Code section 1771.1. Contractor or its subcontractors of any tier shall not be entitled to any additional costs or time arising from or in any way related to compliance with the DIR registration requirements.

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ARTICLE 4 ADMINISTRATION OF THE CONTRACT AND CLAIMS

4.1 ARCHITECT

4.1.1 Replacement of Architect

In the case of the termination of the Architect, the District may appoint an Architect or another construction professional or may perform such functions with its own licensed professional personnel. The status of the replacement Architect under the Contract Documents shall be the same as that of the former Architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 Status

Pursuant to Titles 2 of the California Code of Regulations and as required pursuant to the Field Act, Education Code 81130 et seq., the Architect will provide administration of the Contract Documents and the Work, and will be the District's representative during construction, as well as during the one (1) year period following the commencement of any warranties. The Architect will have authority to act on behalf of the District only to the extent provided in the Contract Documents.

4.2.2 Site Visits

The Architect will visit the Site at intervals necessary in the judgment of the Architect to become generally familiar with the progress and quality of the Work and to determine in general if the Work is being performed in accordance with the Contract Documents and as otherwise required by DSA.

4.2.3 Limitations of Construction Responsibility

The Architect, District and CM shall not have control over, charge of, or be responsible for construction means, methods, techniques, schedules, sequences or procedures, fabrication, procurement, shipment, delivery, receipt, installation, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility under the Contract Documents. The Architect, District and CM shall not be responsible for the Contractor's, Subcontractors', material or equipment suppliers', or any other person's schedules or failure to carry out the Work in accordance with the Contract Documents. The Architect, District and CM shall not have control over or charge of acts or omissions of the Contractor, Subcontractors, their agents or employees, or any other persons or entities performing or supplying portions of the Work. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect, District or CM in the Architect, District or CM's administration of the Contract Documents, or by tests, inspections, or approvals required or performed by persons other than the Contractor.

4.2.4 Communications Facilitating Contract Administration

Except where a CM is on the Project, or as otherwise provided in the Contract Documents or when direct communications are warranted by special circumstances, the District and the Contractor shall communicate through the Architect. In the cases where a CM is hired for the Project, all communication shall be through the CM (unless otherwise directed) with copies to the District, Architect

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and Inspector. Where direct communication is necessary between the District and the Contractor, the District's communication shall be through the District's authorized designated person. The Architect and CM shall be promptly informed, and shall receive copies of all written communications. Contractor shall not rely upon any communications from the District that is not from the District's Representative. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material or equipment suppliers shall be through the Contractor. In the case where a CM is hired for the Project, the CM shall be the main point of contact for communication of information. Copies should be sent to the Architect, District Representative and Inspector.

4.2.5 Payment Applications

The Architect will review and make recommendations to the District regarding the amounts due the Contractor on the Certificates for Payment pursuant to Article 9.3.4 and subject to the Inspector's review, (CM review, if applicable) and Architect's observation. This review of Payment Applications is sometimes called a "Pencil Draft." Return of a Pencil Draft shall constitute the District's dispute of the Payment Application that has been submitted. Contractor shall promptly respond to Pencil Drafts or Contractor's Payment Applications may be delayed. Contractor's failure to promptly respond to a Pencil Draft shall qualify as a delay in the Prompt Payment of a Request for Payment or Request for Retention.

4.2.6 Rejection of Work

In addition to the rights, duties, and obligations of the Inspector under this Article, the Architect may recommend to the District that the District reject Work which does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable to achieve the intent of the Contract Documents, the Architect (and/or CM) may recommend to the District that the District require additional inspection or testing of the Work in accordance with Article 13.5, whether or not such Work is Fabricated, installed, or completed. District may have Non-conforming Work removed and replaced pursuant to Article 9.7. However, neither this authority of the Architect (or CM) 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 (or CM) to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.

Contractor shall, without charge, replace or correct Work found by the District to not be in conformance to Contract requirements. Contractor shall promptly segregate and remove rejected materials from the Project site.

This section is does not address a Notice of Non-Compliance and the remedies associated with a Notice of Non-Compliance which are addressed at Article 7.1.2.

4.2.7 Warranties upon Completion

The Architect (and where applicable CM), in conjunction with the Inspector will conduct field reviews of the Work to determine the date of Substantial Completion and of Final Completion, shall receive and forward to the District for the District's review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment when the Architect believes the Work has been completed in compliance with the requirements of the Contract Documents (See Article 9.11 for Close-Out). The handling by the Architect (or where applicable CM) of such warranties, maintenance manuals, or similar documents shall not diminish or transfer to the Architect any responsibilities or liabilities required by the Contract Documents of the Contractor or other entities, parties, or persons performing or supplying the Work.

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On some Projects, the District will take a phased occupancy of the Project. In those cases, the District may commence the running of warranties on the buildings, or phases that are accepted after Punch List is completed and the District has accepted Completion of the separate phase. A separate Notice of Completion may be filed for the separate building or phase of work and warranties shall commence for the separate phase only to the extent that warranties do not require coordination or connection to other buildings or other parts of the site and only if the warranted item is completed to its entirety in the segregated building or phased area.

If written warranties are not provided at the time the Punch List is nearing completion, Architect (with recommendations from the CM and Inspector) shall determine the dollar value of the warranties and shall make recommendation for withholdings necessary to effectuate the transfer of such warranties to the District for future use as part of the Punch List for the Project pursuant to Article 9.6.

Warranties are not commenced through utilizing of equipment for testing and operation as necessary to acclimate buildings or where necessary to test systems.

4.2.8 Interpretation

The Architect will interpret and decide matters concerning performance and requirements of the Contract Documents. Architect shall make clarifications as necessary to interpret the Contract Documents.

4.3 PROJECT INSPECTOR

4.3.1 General

One or more Project Inspectors employed by the District and approved by the Division of the State Architect will be assigned to the Work in accordance with the requirements of Title 24 of the California Code of Regulations. The Inspector(s) duties are as specifically defined in Title 24 Section 4-333 and 4-342 and in DSA IR A-8.

4.3.2 Inspector's Duties and DSA Noted Timelines for Inspection

All Work shall be under the observation of the Inspector. Contractor shall establish a protocol for requesting inspection with Inspector so as to not delay the Work and provide adequate time for the Inspector to perform inspection. If such a protocol is not established ahead of time, Inspector may utilize the time criteria set by Title 24 of 48 hours in advance of submitting form DSA 156 for each new area. The Inspector shall have free access to any or all parts of the Work at any time. The Contractor shall furnish the Inspector such information as may be necessary to keep the Inspector fully informed regarding progress and manner of Work and character of materials. Such observations shall not, in any way, relieve the Contractor from responsibility for full compliance with all terms and conditions of the Contract, or be construed to lessen to any degree the Contractor's responsibility for providing efficient and capable superintendence. The Inspector is not authorized to make changes in the Drawings or Specifications nor shall the Inspector's approval of the Work and methods relieve the Contractor of responsibility for the correction of subsequently discovered defects, or from its obligation to comply with the Contract Documents.

Inspector shall electronically post DSA required documents on the DSA electronic posting website. It is the Contractor's responsibility to determine the status of posting and determine if all the

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criteria for sign off of a category of Work on the Project Inspection Card (Form DSA 152) as defined more thoroughly in the most current version of the DSA 152 manual posted on the DSA website.

Inspector may collaborate with Contractor about approval of areas that may be constructed and approved incrementally under the DSA 152 card pursuant to the guidelines of PR-13 at Article 1.17. Inspector shall work with Contractor to present incremental approval proposals to DSA.

4.3.3 Inspector's Authority to Reject or Stop Work

The Inspector shall have the authority to reject Work whenever provisions of the Contract Documents are not being complied with, and Contractor shall instruct its Subcontractors and employees accordingly. In addition, the Inspector may stop any Work that poses a probable risk of harm to persons or property. The Contractor shall instruct its employees, Subcontractors, material and equipment suppliers, etc., accordingly. The absence of any Stop Work Order or rejection of any portion of the Work shall not relieve the Contractor from any of its obligations pursuant to the Contract Documents.

4.3.4 Inspector's Facilities

Within seven (7) days after the notice to proceed, the Contractor shall provide the Inspector with the temporary facilities as required. More specific requirements for the Inspector facilities may be further described under Division 1 of the Specifications.

4.3.5 Testing Times

The District will provide inspection and testing at its cost during the normal eight (8) hour day Monday through Friday (except holidays). Work by the Contractor outside of the normal eight (8) hour day shall constitute an authorization from the Contractor to the District to provide inspection and testing as required outside of the normal eight (8) hour day. Contractor shall provide adequate time for inspections so as to not delay the Work. An advanced timing protocol may be established pursuant to Article 4.3.2. If the Contractor is behind Schedule then it is incumbent on the Contractor to provide advance forecast through look ahead of the anticipated date for inspection so the Inspector may plan their activities so as to not delay the Project. Contractor shall reimburse District for any additional costs associated with inspection and testing (including re-inspection and re-testing) outside the normal eight-hour day and for any retests caused by the Contractor.

It is the Contractor's responsibility to request special inspections with sufficient time so all testing may be timely completed and posted so work may proceed and the Inspector's signature is attached to the Project Inspection Card (Form 152). Specifically, timely request for special inspection under the DSA Verified Report Forms 291 (laboratory), DSA Verified Report Form 292 (Special Inspection), and DSA Verified Report 293 (geotechnical) since DSA requirements under PR 13-01 specifically gives the Special Inspections 14 days to post to the DSA website. Failure to plan and pay (if applicable) for quicker delivery of Special Inspections may be counted as Float, but is not considered Governmental Delay Float under Article 8.1.4.

4.3.6 Special Inspections, Inspections or Tests Out of State, Out of Country or Remote from Project

If Contractor has a Subcontractor or supplier that requires in plant or special inspections, inspections or tests that are out of the country, out of the state or a distance of more than 200 miles from the Project Site, the District shall provide the Special Inspector or individual performing tests time for

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inspection and testing during normal work hours. Contractor, however, is responsible for the cost of travel, housing, food, out of area premiums that may be in the Inspector/Testing Agreement with District, or other expenses necessary to ensure proper inspection, special inspection or testing is provided by a DSA Certified Inspector, Special Inspector, or individual performing tests. In some cases all three (DSA Inspector, Special Inspector, and Tester) may be required. In addition, if the DSA Certified Inspector, Special Inspector, or individual performing test has contractual travel clauses or special rates for out of town inspection, Contractor is responsible for all costs associated with the contractual travel costs in addition to all other costs. Arrangements for inspection and/or testing shall be made far enough in advance so as to not delay the Work.

4.4 STOP WORK ORDER

DSA may issue a Stop Work Order, or an Order to Comply, when either (1) the Work proceeds without DSA approval; (2) the Work proceeds without a DSA Inspector of Record, or (3) where DSA determines that the Work is not being performed in accordance with applicable rules and regulations, and would compromise the structural integrity of the Project or would endanger lives. If a Stop Work Order is issued, the Work in the affected area shall cease until DSA withdraws the Stop Work Order. Pursuant to Education Code section 81133.5, the District shall not be held liable in any action filed against the District for any delays caused by compliance with the Stop Work Order, except to the extent that an error or omission by the District is the basis for the issuance of the Stop Work Order.

Examples of Stop Work Orders that may be issued by DSA include DSA Bulletin 07-04 and Policy 10-01, the installation of automatic fire sprinkler systems without approved Plans, covering Work that has not been approved by Inspector on DSA Project Inspection Card (Form 152).

4.5 RESPONSIBILITY FOR ADDITIONAL CHARGES INCURRED BY THE DISTRICT FOR PROFESSIONAL SERVICES

If at any time prior to the completion of the requirements under the Contract Documents, the District is required to provide or secure additional professional services (including CM, Inspection, Architect, Engineering and Special Consultant Services) for any reason by any act of the Contractor, the District may seek a Deductive Change Order for any costs incurred for any such additional services, which costs shall be deducted from the next progress payment. A Deductive Change Order shall be independent from any other District remedies and shall not be considered a waiver of any District rights or remedies. If payments then or thereafter due to the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the District. Additional services shall include, but shall not be limited to, the following:

- a. Services made necessary by the default of the Contractor (Article 14 or Article 2.2).
- b. Services made necessary due to the defects or deficiencies in the Work of the Contractor (Article 2.2 and Article 9.6).
- c. Spurious or frivolous RFI's issued that do not conform to the requirements of Article 7.4. Issuance of the same RFI after receiving an answer from the Architect or Engineer
- d. Review of Schedules that are provided by Contractor that do not Conform with the Requirements of Article 8.

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- e. Preparation of a CCD or ICD to correct a Contractor Deficiency, or Contractor Caused Notice of Non-Compliance (Article 7.3).
- f. Review of Incomplete Shop Drawings or Submittals, including the submission of Piecemeal Shop Drawings or Submittals unless piecemeal Submittals are specifically agreed upon by District (Article 3.9)
- g. Services required by failure of the Contractor to perform according to any provision of the Contract Documents.
- h. Services in connection with evaluating substitutions of products, materials, equipment, Subcontractors' proposed by the Contractor, and making subsequent revisions to Drawings, Specifications, obtaining DSA approvals, DSA costs for review of CCD's, other governmental agency review costs, and providing other documentation required (except for the situation where the specified item is no longer manufactured or available). (Article 3.10)
- i. Services for evaluating and processing Claims or Disputes submitted by the Contractor in connection with the Work outside the established Change Order process.
- j. Services required by the failure of the Contractor to prosecute the Work in a timely manner in compliance within the specified time of completion.
- k. Services in conjunction with the testing, adjusting, balancing and start-up of equipment other than the normal amount customarily associated for the type of Work involved.
- l. Services in conjunction with more than one (1) re-review of Submittals of Shop Drawings, Product Data, samples, RFI's etc.

4.6 DISPUTES AND CLAIMS

4.6.1 Decision of Architect

“Disputes” and “Claims” as defined in Article 4.6.9.1 between District and Contractor involving money or time, including those alleging an error or omission by the Architect shall be referred initially to the Architect for action as provided in Article 4.6.2 within ten (10) days after Contractor's Article 7 request for Change is denied. If there is a CM, the CM shall receive the Dispute and may review and also assemble opinions and documents to assist the Architect. A decision by the Architect, as provided in Article 4.6.5, shall be required as a condition precedent to proceeding with remedies set forth in Article 4.6.9 as to all such matters arising prior to the date Retention Payment Application is due, regardless of whether such matters relate to execution and progress of the Work, or the extent to which the Work has reached Final Completion.

The condition precedent of an Architect decision shall be waived if: (1) the position of Architect is vacant; (2) the Architect has failed to take action required under Article 4.6.5 within the time periods required therein; or (3) the Dispute or Claim relates to a stop notice claim not arising from any extra Change Order or Immediate Change Directive for which approval has not been provided.

4.6.2 Architect's Review

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The Architect (and CM) will review the Dispute and take one or more of the following preliminary actions upon receipt of a Dispute: (1) request additional supporting data from the claimant; (2) submit a schedule to the parties indicating when the Architect expects to take action; (3) reject the Dispute in whole or in part, stating reasons for rejection; (4) recommend approval of the Dispute; or (5) suggest a compromise. The Architect may also, but is not obligated to, notify the Surety, if any, of the nature and amount of the Dispute.

4.6.2.1 *Architectural Immunity.* Architect review of Disputes and Claims shall be impartial and meant to resolve Disputes and Claims. Pursuant to the case, Huber, Hunt & Nichols, Inc. v. Moore (1977) 67 Cal.App.3d 278, the Architect is provided a quasi-judicial immunity for interpreting and deciding Disputes and Claims between the District and Contractor.

4.6.3 Documentation if Resolved

If a Dispute has been resolved, the Architect (and/or CM) will prepare a Change Order or obtain appropriate documentation to document the terms for Board approval.

4.6.4 Actions if Not Resolved

If a Dispute has not been resolved and all documentation requested pursuant to Article 4.6.2 has been provided, the Contractor shall, within ten (10) days after the Architect's initial response, assemble all the documents involved in the Dispute including copies of all back-up documentation of costs and the basis for the Dispute and take one or more of the following actions: (1) modify the initial Dispute; (2) notify the Architect that the initial Dispute stands; or (3) supplement with additional supporting data and re-submit to the Architect under Article 4.6.2.

4.6.5 Architect's Written Decision

If a Dispute has not been resolved after consideration of the foregoing and of other evidence presented by the parties or requested by the Architect, the Architect (or Architect through CM) the Architect shall provide a written decision twenty (20) days after compliance with Article 4.6.4. Upon expiration of such time period, the Architect (or Architect through CM) will render to the parties its written decision relative to the Dispute, including any change in the Contract Sum or Contract Time or both.

The Architect may also request reasonable additional time to complete Architect's written decision.

If the resolution of the Dispute by the Architect is not satisfactory to the Contractor and copies of all back-up documentation of costs and the basis for the Dispute is fully articulated in a package of material that is complete, the Contractor may then submit a Claim to the District under Article 4.6.9

4.6.6 Continuing Contract Performance

Pending final resolution of a Dispute or Claim, including, negotiation, mediation, arbitration, or litigation, the Contractor shall proceed diligently with performance of the Contract, and the District shall continue to make any undisputed payments in accordance with the Contract (less any withholdings or offsets). If the Claim is not resolved, Contractor agrees it will neither rescind the Contract nor stop the progress of the work, but Contractor's sole remedy shall be to submit such controversy to determination by a court of competent jurisdiction in the county where the Project is located, after the Project has been completed, and not before.

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4.6.6.1 *District's Option to Submit Individual Disputes to Arbitration during Claims and Disputes Process.* At the District's sole option, in order to more efficiently resolve Claims during the Project and prior to the completion of the Claims Process, pursuant to Government Code section 9201, the District may submit individual Disputes or Claims for binding arbitration and Contractor agrees to the resolution of for each individual Dispute or Claim by an Arbitrator, including resolution of time and delays. If binding arbitration is utilized for individual Disputes or Claims, such resolution is full and final as to that particular Dispute or Claim. THIS INDIVIDUAL DISPUTE ARBITRATION PROCESS IS NOT AN ARBITRATION CLAUSE AND SHALL NOT BE CONSTRUED AS AN AGREEMENT TO ARBITRATE. THIS INDIVIDUAL DISPUTES ARBITRATION PROCESS IS FOR THE SOLE PURPOSE OF STREAMLINING AND RESOLVING DISPUTES OR CLAIMS DURING CONSTRUCTION AND SHALL BE REQUESTED ON SPECIFIC INDIVIDUAL ITEMS BY THE DISTRICT PRIOR TO RETENTION PAYMENT (EVEN IF THERE ARE DEDUCTIONS MADE FROM RETENTION PAYMENT) WHICH REPRESENTS THE FINAL COMPLETION OF THE PROJECT.

- a. If there is no Retention remaining on the Project, individual Disputes initiated prior to Project Final Completion shall continue until a final disposition of the Arbitration or resolution of the individual Claim or Dispute.
- b. No Tolling. The Arbitration process shall not toll the Disputes or Claims process under Article 4.6 or the requirement to submit Claims to Court under Article 4.6.9.4.

4.6.7 Claims for Concealed Trenches or Excavations Greater Than Four Feet Below the Surface

When any excavation or trenching extends greater than four feet below the surface or if any condition involving hazardous substances are encountered:

- a. Immediately upon discovery, The Contractor shall promptly, and before the following conditions are disturbed, notify the District, by telephone and in writing, of the condition except:
 1. If such condition is a hazardous waste condition, Contractor's bid includes removal or disposal of hazardous substances. Material that the Contractor believes may be a material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law. In such case, the notice bulletin procedures of Article 7 apply.
 2. Subsurface or latent physical conditions at the Site differing from those indicated in the Drawings, Specifications, Soils Report, and from Contractor's own investigation under Article 2.1.
 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.

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- b. The District shall investigate the conditions, and if District finds that the conditions do materially so differ, 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 shall issue a Change Order or Construction Change Document under the procedures described in the Contract.
- c. In the event that a dispute arises between the public entity or District and the Contractor whether the conditions materially differ, 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, 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.

4.6.8 Dispute Concerning Extension of Time.

If Contractor and District cannot agree upon an extension of time, whether compensable or not, then Contractor must have first completed the procedures set forth in Article 8.4. Upon completion of the procedures set forth under Article 8.4, Contractor must then comply with the requirements in this Article including those set forth under Article 4.6.9.

4.6.9 Claims Procedures

Pursuant to the remedies under Public Contract Code section 9201 and Government Code section 930.2, Contractor, through execution of this Agreement, also agrees to comply with the Disputes and Claims requirements of Article 4.6 to quickly and efficiently resolve Disputes and Claims. Further, to provide a level of accuracy to the records submitted, the District shall have the right to audit books and records pursuant to Article 13.11 based on the actual costs incurred and to reduce the uncertainty in resolving Disputes and Claims with limited information.

4.6.9.1 *Procedure Applicable to All Claims*

- a. Definition of Claim: A "Claim" is where a Dispute between the parties rises to the level where backup documentation is assembled and provided to the District as a separate demand by the Contractor for: (1) a time extension including, without limitation, for relief from damages or penalties for delay assessed by the District under the Contract; (2) payment by the District of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment for which is not otherwise expressly provided for or to which the Contractor is not otherwise entitled to; or (3) an amount of payment disputed by the District. If the Claim is for damages associated with a DSA Stop Work Order, the Contractor shall not be entitled to a request for Compensation, but shall be entitled to utilize Governmental Delay Float (See Article 8.1.4.1.)
- b. Filing Claim Is Not Basis to Discontinue Work: The Contractor shall promptly comply with Work under the Contract or Work requested by the District even though a written Claim has been filed. The Contractor and

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the District shall make good faith efforts to resolve any and all Claims that may arise during the performance of the Work covered by this Contract.

- c. Claim Notification: The Contractor shall within seven (7) calendar days after the written decision of the Architect, or if the time period for Architect's decision has passed under Article 4.6.1, submit a notification in writing sent by registered mail or certified mail return receipt requested to the District (and the District's CM) stating clearly the basis for the Claim and including all relevant and required documents. If the notification is not submitted within seven (7) days after the written decision of the Architect or the passage of time under Article 4.6.1, the Contractor shall be deemed to have waived all right to assert the Claim, and the Claim shall be denied. Claims submitted after the Retention Payment date shall also be considered null and void by the District. All Claims shall be reviewed pursuant to Articles 4.6.1 through 4.6.5.

The Formal Notification of Claim must be presented as follows:

- (1) The term "Claim" must be at the top of the page in no smaller than 20 point writing.
 - (2) All documentation submitted pursuant to Article 4.6 to the Architect shall be submitted with the "Claim."
 - (3) A stack of documents, copy of all Project documents, or the submission of random documents shall not constitute an adequate reference to supporting documentation.
 - (4) Any additional or supporting documentation that Contractor believes is relevant should be submitted at this time.
- d. Reasonable Documents to Support Claim: The Contractor shall furnish reasonable documentation to support the Claim. The Contractor shall provide all written detailed documentation which supports the Claim, including but not limited to: arguments, justifications, cost, estimates, Schedule analysis and detailed documentation. The format of the required reasonable documentation to support the Claim shall include, without limitation:
1. Cover letter.
 2. Summary of factual basis of Claim and amount of Claim.
 3. Summary of the basis of the Claim, including the specific clause and section under the Contract under which the Claim is made.
 4. Documents relating to the Claim, including:
 - a. Specifications sections in question.
 - b. Relevant portions of the Drawings

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- c. Applicable Clarifications (RFI's)
 - d. Other relevant information, including responses that were received.
 - e. Contractor Analysis of Claim merit.
 - (a) Contractor's analysis of any Subcontractor vendor Claims that are being passed through.
 - (b) Any analysis performed by outside consultants
 - (c) Any legal analysis that Contractor deems relevant
 - f. Break down of all costs associated with the Claim.
 - g. For Claims relating to time extensions, an analysis and supporting documentation evidencing any effect upon the critical path in conformance with the requirements of Article 8.4 chronology of events and related correspondence.
 - h. Applicable Daily Reports and logs.
 - (a) If the Daily Reports or Logs are not available, lost or destroyed, there shall be a presumption that the lost documentation was unfavorable to the Contractor. See California Civil Jury Instruction 204.
 - i. For Claims involving overhead, cost escalation, acceleration, disruption or increased costs, a full version of job costs reports organized by category of work or Schedule of Values with budget information tracked against actual costs. Any and all supporting back-up data, including the original bid (and associated original unaltered metadata).
 - (a) The metadata and bid information shall be provided confidentially and subject to a protective order to prevent dissemination to other contractors or to the public. However, the bid documentation should remain intact and available for review and inspection in case of this type of increased cost Claim.
 - (b) This data on the bid shall be made available to any District attorneys or experts and shall also be utilized as evidence for any legal proceedings.
 - (c) If the bid documentation is not available, lost or destroyed, there shall be a presumption that the lost bid documentation was unfavorable to the Contractor. See California Civil Jury Instruction 204.
- f. Certification: The Contractor (and Subcontractors, if applicable) shall submit with the Claim a certification under penalty of perjury:
- 1. That the Contractor has reviewed the Claim and that such Claim is made in good faith;

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2. Supporting data are accurate and complete to the best of the Contractor's knowledge and belief;
 3. The amount requested accurately reflects the amount of compensation for which the Contractor believes the District is liable.
 4. That the Contractor is familiar with Government Code sections 12650 et seq. and Penal Code section 72 and that false claims can lead to substantial fines and/or imprisonment.
- g. Upon receipt of a Claim and all supporting documents as required above, the District shall conduct a reasonable review of the Claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Upon receipt of a Claim, the District and Contractor may, by mutual agreement, extend the time period provided in this paragraph.
- h. If the District needs approval from its governing Board to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the governing Board does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three days following the next duly publicly noticed meeting of the governing Board after the 45-day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.
- i. Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the District issues its written statement. If the District fails to issue a written statement, paragraph o below shall apply.
- j. If the Contractor disputes the District's written response, or if the District fails to respond to a Claim issued pursuant to this Article 4.6.9 within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the District shall schedule a meet and confer conference within 30 days for settlement of the Claim.
- k. Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the District shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the District issues its written statement. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with

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the District and the Contractor sharing the associated costs equally. The District and Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the Claim remaining in dispute shall be subject to applicable procedures in Article 4.6.9.4.

- l. For purposes of this Article 4.6.9, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.
- m. Unless otherwise agreed to by the District and the Contractor in writing, the mediation conducted pursuant to this Article 4.6.9 shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.
- n. This Claims process does not preclude the District from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this Article 4.6.9 does not resolve the parties' Claim. This Claims process does not preclude the District from submitting individual Disputes or Claims to binding arbitration pursuant to Article 4.6.9.3 below.
- o. Failure by the District to respond to a Claim from the Contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this Article 4.6.9 shall result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the District's failure to have responded to a Claim, or its failure to otherwise meet the time requirements of this Article 4.6.9, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of the Contractor.
- p. If a subcontractor or a lower tier subcontractor lacks legal standing to assert a Claim against a District because privity of contract does not exist, the Contractor may present to the District a Claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the Contractor present a Claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the Claim be presented to the District shall furnish reasonable documentation to support the Claim. Within 45 days of receipt of this written request, the Contractor shall notify the subcontractor in writing as to whether the Contractor

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presented the Claim to the District and, if the Contractor did not present the Claim, provide the subcontractor with a statement of the reasons for not having done so.

- q. Upon receipt of a Claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable.
- r. The Contractor's Claim shall be denied if it fails to follow the requirements of this Article.

4.6.9.2 District (through CM or District's Agent or Attorney) May Request Additional Information: Within thirty (30) days of receipt of the Claim and the information under this Article, the District may request in writing any additional documentation supporting the Claim or documentation relating to defenses to the Claim which the District may assert. If additional documents are required, the time in which the Claim is evaluated may be extended by a reasonable time so the Claim and additional documents may be reviewed. *Claims Procedures in Addition to Government Code Claim.* Nothing in the Claims procedures set forth in this Article 4 of the General Conditions shall act to waive or relieve the Contractor from meeting the requirements set forth in Government Code section 900 et seq.

4.6.9.3 *Binding Arbitration of Individual Claim Issues.* To expedite resolution of Claims pursuant to Public Contract Code section 9201, at the District's sole option, the District may submit individual Claims to Arbitration prior to Retention Payment consistent with the requirements of Article 4.6.6.1

4.6.9.4 *Resolution of Claims in Court of Competent Jurisdiction.* If Claims are not resolved under the procedure set forth and pursuant to Article 4.6.9, such Claim or controversy shall be submitted to a court in the County of the location of the Project after the Project has been completed, and not before.

4.6.9.5 *Warranties, Guarantees and Obligations.* The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon Contractor by the General Conditions and amendments thereto; and all of the rights and remedies available to District and Architect thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Article will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

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ARTICLE 5 SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 Subcontractual Relations Bound to Same Contract Terms at General Contractor

By appropriate agreement, written where legally required for validity, 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 same obligations and responsibilities, assumed by Contractor pursuant to the Contract Documents. Each subcontract agreement shall preserve and protect the rights of the District and the 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. 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. Upon written request of the Subcontractor, the Contractor shall identify to the Subcontractor the terms and conditions of the proposed subcontract agreement, which may be at variance with the Contract Documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.1.2 Subcontractor Licenses

All Subcontractors shall be properly licensed by the California State Licensing Board. All Subcontractors (of any tier) performing any portion of the Work must comply with the Labor Code sections 1725.5 and 1771.1 and must be properly and currently registered with the California Department of Industrial Relations and qualified to perform public works pursuant to Labor Code section 1725.5 throughout the duration of the Project. No portion of the Work is permitted to be performed by a Subcontractor of any tier unless the subcontractor is properly registered with DIR. Any Subcontractors of any tier not properly registered with DIR shall be substituted in accordance with Labor Code section 1771.1.

5.1.3 Substitution of Subcontractor

Substitution of Subcontractors shall be permitted only as authorized under Public Contract Code §§ 4107 et seq. Any substitutions of Subcontractors shall not result in any increase in the Contract Price or result in the granting of any extension of time for the completion of the Project.

5.1.4 Contingent Assignment of Subcontracts and Other Contracts

Each subcontract, purchase order, vendor contract or agreement for any portion of the Work is hereby assigned by the Contractor to the District provided that:

- a. Such assignment is effective only after Termination of this Contract with the Contractor by the District as provided under Article 14 and only for those subcontracts and other contracts and agreements that the District accepts by notifying the Subcontractor or Materialman (as may be applicable) in writing; and
- b. Such assignment is subject to the prior rights of the Surety(ies) obligated under the Payment Bond and Performance Bond.

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- c. The Contractor shall include adequate provisions for this contingent assignment of subcontracts and other contracts and agreements in each such document.

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ARTICLE 6 CONSTRUCTION BY DISTRICT OR BY SEPARATE CONTRACTORS

6.1 DISTRICT'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 Separate Contracts.

6.1.1.1 District reserves the right to let other contracts in connection with this Work. Contractor shall afford other contractors reasonable opportunity for (1) introduction and storage of their materials; (2) access to the Work; and (3) execution of their work. Contractor shall properly connect and coordinate its work with that of other Contractors.

6.1.1.2 If any part of Contractor's Work depends on proper execution or results of any other contractor, the Contractor shall inspect and within seven (7) days or less, report to Architect, in writing, any defects in such work that render it unsuitable for proper execution of Contractor's Work. Contractor will be held accountable for damages to District for that Work which it failed to inspect or should have inspected. Contractor's failure to inspect and report shall constitute its acceptance of other contractors' Work as fit and proper for reception of its Work, except as to defects which may develop in other contractors' work after execution of Contractor's work.

6.1.1.3 To ensure proper execution of its subsequent Work, Contractor shall measure and inspect Work already in place and shall at once report to the Architect in writing any discrepancy between executed Work as built and the Contract Documents.

6.1.1.4 Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by District in prosecution of the Project and the potential impact of such Work on the Baseline Schedule or Schedule updates.

6.1.1.5 Nothing herein contained shall be interpreted as granting to Contractor the exclusive occupancy at the site of Project. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project Site. If execution of any contract by the District is likely to cause interference with Contractor's performance of this Contract, once Contractor provides District timely written notice and identifies the Schedule Conflict, District shall decide which contractor shall cease work temporarily and which contractor shall continue, or whether Work can be coordinated so that contractors may proceed simultaneously.

6.1.1.6 District shall not be responsible for any damages suffered or extra costs incurred by Contractor resulting directly or indirectly from award or performance or attempted performance of any other contract or contracts at the Project necessary for the performance of the Project (examples include Electrical Utility Contractor, separate offsite contractor, a separate grading contractor, furniture installation etc.)

CONTRACTOR IS AWARE THAT THIS CONTRACT MAY BE SPLIT INTO SEVERAL PHASES BASED ON DOCUMENTATION PROVIDED WITH THIS BID OR DISCUSSED AT THE JOB WALK. CONTRACTOR HAS MADE ALLOWANCE FOR ANY DELAYS OR DAMAGES WHICH MAY ARISE FROM COORDINATION WITH CONTRACTORS REQUIRED FOR OTHER PHASES. IF ANY DELAYS SHOULD ARISE FROM ANOTHER CONTRACTOR

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WORKING ON A DIFFERENT PHASE, CONTRACTOR'S SOLE REMEDY FOR DAMAGES, INCLUDING DELAY DAMAGES, SHALL BE AGAINST THE CONTRACTOR WHO CAUSED SUCH DAMAGE AND NOT THE DISTRICT. CONTRACTOR SHALL PROVIDE ACCESS TO OTHER CONTRACTORS FOR OTHER PHASES AS NECESSARY TO PREVENT DELAYS AND DAMAGES TO OTHER CONTRACTORS WORKING ON OTHER PHASES OF CONSTRUCTION.

6.1.2 District's Right to Carry Out the Work

See Article 2.2.

6.1.3 Designation as Contractor

When separate contracts are awarded to contractors on the Project Site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate District/Contractor Agreement.

6.1.4 District Notice to the Contractor of Other Contractors

The Contractor shall have overall responsibility to reasonably coordinate and schedule Contractor's activities with the activities of the District's forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the District in reviewing their construction schedules when:

- a. Notice is provided in the Contract Documents of other scope of Work,
- b. In the case where there is known Work to be performed by other Contractors
- c. For outside contractors hired by utilities
- d. Where the Contract Document provides "Work by Others" or "By Others"
- e. Where specifically noted during the Pre-Bid Conference
- f. Where specifically noted in the Mandatory Job Walk
- g. By CO or ICD,
- h. With respect to the installation of :
 1. Furniture,
 2. Electronics and networking equipment,
 3. Cabling,
 4. Low voltage,
 5. Off-site work,
 6. Grading (when by a separate contractor),
 7. Environmental remediation when excluded by the Contract Documents (i.e. asbestos, lead or other hazardous waste removal)
 8. Deep cleaning crews,

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9. Commissioning and testing,
10. Keying and re-keying,
11. Programming

6.1.4.2 Exception where no Coordination is Required on the Part of the Contractor for Turn Key Operations. If the Contractor has specifically outlined a “Turn Key” or “Complete Delivery” of a final completed operational campus or building in writing as part of the Baseline Schedule..

6.1.4.3 The Contractor shall make any revisions to the Baseline Schedule (or Schedule Update) and Contract Sum deemed necessary after a joint review and mutual agreement. The Baseline Schedule (or Schedule Update) shall then constitute the Schedules to be used by the Contractor, separate contractors, and the District until subsequently revised. Additionally, Contractor shall coordinate with Architect, District, and Inspector to ensure timely and proper progress of Work.

6.2 CONSTRUCTIVE OWNERSHIP OF PROJECT SITE AND MATERIAL

Upon commencement of Work, the Contractor becomes the constructive owner of the entire site, improvements, material and equipment on Project site. Contractor must ensure proper safety and storage of all materials and assumes responsibility as if Contractor was the owner of the Project site. All risk of loss or damage shall be borne by Contractor during the Work until the date of Completion. As constructive owner of the Project site, Contractor must carry adequate insurance in case of calamity and is not entitled to rely on the insurance requirements as set forth in this Agreement as being adequate coverage in case of calamity.

6.3 DISTRICT’S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors, and the District as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in Article 3.12, the District may clean up and allocate the cost among those it deems responsible.

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ARTICLE 7 CHANGES IN THE WORK

7.1 CHANGES

7.1.1 No Changes Without Authorization

There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order, Change Order Request, Immediate Change Directive, or order by the Architect for a minor change in the Work as herein provided. District shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District's Governing Board or designated representative with delegated authority (subject to Board ratification) has authorized the same and the cost thereof approved in writing by Change Order or executed Construction Change Document. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications. Notwithstanding anything to the contrary in this Article 7, all Change Orders shall be prepared and issued by the Architect and shall become effective when executed by the District's Governing Board, the Architect, and the Contractor.

Should any Change Order result in an increase in the Contract Price, the cost of such Change Order shall be agreed to, in writing, in advance by Contractor and District and be subject to the monetary limitations set forth in Public Contract Code section 20659 (Please check with the District since there are different interpretations of the limitations of Public Contract Code section 20659 depending on the County the Project is located). In the event that Contractor proceeds with any change in Work without first notifying District and obtaining the Architect's and District's consent to a Change Order, Contractor waives any Claim of additional compensation for such additional work and Contractor takes the risk that a Notice of Non-Compliance may issue, a critical path Project delay may occur, and the Contractor will also be responsible for the cost of preparation and DSA CCD review fees for a corrective DSA approved Construction Change Document.

CONTRACTOR UNDERSTANDS, ACKNOWLEDGES, AND AGREES THAT THE REASON FOR THIS NOTICE REQUIREMENT IS SO THAT DISTRICT MAY HAVE AN OPPORTUNITY TO ANALYZE THE WORK AND DECIDE WHETHER THE DISTRICT SHALL PROCEED WITH THE CHANGE ORDER OR ALTER THE PROJECT SO THAT SUCH CHANGE IN WORK BECOMES UNNECESSARY AND TO AVOID THE POSSIBLE DELAYS ASSOCIATED WITH THE ISSUANCE OF A NOTICE OF NON-COMPLIANCE.

7.1.2 Notices of Non-Compliance

Contractor deviation or changes from approved Plans and Specifications may result in the issuance of a Notice of Non-Compliance (See DSA Form 154). Contractor is specifically notified that deviations from the Plans and Specifications, whether major or minor, may result in the requirement to obtain a DSA Construction Change Document to correct the Notice of Non-Compliance. (See Article 7.3.1 for Definition of CCD). In some cases, the lack of a DSA approved CCD AND verification from the Inspector that a Notice of Non-Compliance has been corrected may result in a critical path delay to the next stage of Work on the Project. Specifically, a deviation from approved Plans and Specifications may prevent

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approval of the category of Work listed in the DSA 152 Project Inspection Card. Any delays that are caused by the Contractor's deviation from approved Plans and Specifications shall be the Contractor's responsibility.

7.1.3 Architect Authority

The Architect will have authority to order minor changes in the Work that do not involve DSA Approval not involving any adjustment in the Contract Sum, or an extension of the Contract Time.

7.2 **CHANGE ORDERS ("CO")**

A CO is a written instrument prepared by the Architect and signed by the District (as authorized by the District's Governing Board), the Contractor, and the Architect stating their agreement upon all of the following:

- a. A description of a change in the Work;
- b. The amount of the adjustment in the Contract Sum, if any; and
- c. The extent of the adjustment in the Contract Time, if any.

A CO may be comprised of ICD's, Response to RFP's and COR's

7.3 **CONSTRUCTION CHANGE DOCUMENT (CCD Category A, and CCD Category B) and IMMEDIATE CHANGE DIRECTIVE (ICD)**

7.3.1 Definitions

7.3.1.1 *Construction Change Document (CCD)*. A Construction Change Document is a DSA term that is utilized to address changes to the DSA approved Plans and Specifications. There are two types of Construction Change Documents. (1) DSA approved CCD Category A for Work affecting structural, access compliance or fire/ life safety of the Project which will require a DSA approval; and, (2) CCD Category B for Work NOT affecting structural safety, access compliance or fire/ life safety that will not require a DSA approval (except to confirm that no approval is required). Both CCD Category A and Category B shall be set forth in DSA Form 140 and submitted to DSA as required.

7.3.1.2 *Immediate Change Directive (ICD)*. An Immediate Change Directive is a written order to the Contractor prepared by the Architect and signed by the District (and CM if there is a CM on the Project) and the Architect, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The District may by ICD, without invalidating the Contract, direct immediate changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions within. If applicable, the Contract Sum and Contract Time will be adjusted accordingly.

In the case of an Immediate Change Directive being issued, Contractor must commence Work immediately or delays from failure to perform the ICD shall be the responsibility of Contractor and the failure to move forward with Work immediately shall also be grounds for Termination under Article 14.

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An ICD does not automatically trigger an Article 7.6 Dispute or Claim. Contractor must timely follow the procedures outlined at Article 7.6 and 4.6 where applicable.

Refer to Division 1 and Supplementary General Conditions for a copy of the proposed Immediate Change Directive form.

7.3.2 Use to Direct Change

An ICD shall be used to move work forward immediately and to avoid delay. In some cases, an ICD shall be issued in the absence of agreement on the terms of a CO, COR, or RFP. A copy of an ICD form is provided in the Supplementary General Conditions and Division 1. The anticipated not to exceed price for the Work will be inserted into the ICD. In the case of an ICD issued to correct Contractor Deficiencies or to correct a Contractor caused Notice of Non-Compliance, the ICD may be issued with \$0 and no additional time. Contractor may prepare a COR associated with the ICD pursuant to Article 7. However, Contractor shall proceed with all Work required under an Approved ICD immediately upon issuance. Failure to proceed with the Work under an ICD shall be grounds for Termination for Cause under Article 14 or take over the Work under Article 2.2.

If adequate time exists, an ICD may be subject of an RFP for pricing and determination if any time that may be required. However, if an RFP is not completed, Contractor shall immediately commence Work when an ICD is issued. If the RFP is incomplete, it may still be completed to be submitted for pricing purposes as long as the RFP is submitted within the timeline provided by the RFP, or within 10 days following issuance of the ICD.

7.3.3 ICD Issued Over a Notice of Non-Compliance or to Cover Work Subject to a DSA 152 Sign Off

In some cases, an ICD shall be for the purpose of proceeding with Work to keep the Project on Schedule and as an acknowledgement by the District that Contractor is proceeding with Work contrary to a Notice of Non-Compliance, prior to issuance of a DSA approved CCD Category A, or to direct the covering of Work which has not yet received a DSA 152 Inspection Approval to move forward.

7.3.3.1 *Contractor Compliance with all Aspects of an ICD.* Contractor is to undertake the ICD and comply with all aspects of the Work outlined in the ICD. Inspector is to inspect the Work pursuant to the ICD. Failure to follow the ICD may result in deduction of the ICD Work under Article 2.2 or Termination of the Contractor pursuant to Article 14.

7.3.3.2 *Exception in the Case of DSA Issued Stop Work Order.* Contractor must proceed with an ICD even if a CCD has not been approved by DSA except in the case of a DSA issued Stop Work Order. If a DSA Stop Work Order is issued, Contractor must stop work and wait further direction from the District.

7.3.3.3 *ICD Due to Contractor Deficiency or Contractor Caused Notice of Non-Compliance.* If an ICD is issued to correct a Contractor Deficiency or a Contractor caused notice of Non-Compliance, Contractor specifically acknowledges responsibility for all consequential damages associated with the Contractor Deficiency or Contractor caused Notice of Non-Compliance and all consequential damages and costs incurred to correct the deficiency under Article 4.5

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7.4 REQUEST FOR INFORMATION (“RFI”)

7.4.1 Definition

A RFI is a written request prepared by the Contractor requesting the Architect to provide additional information necessary to clarify or amplify an item which the Contractor believes is not clearly shown or called for in the Drawings or Specifications, or to address problems which have arisen under field conditions.

7.4.1.1 A RFI shall not be used as a vehicle to generate time extensions.

7.4.1.2 Resubmission of the same or similar RFI is not acceptable. RFI’s that are similar should be addressed in Project meetings where the requestor (Contractor, Subcontractor or vendor) is able to address the particular issue with the Architect or Engineer and a resolution addressed in the minutes.

7.4.1.3 A RFI response applicable to a specific area cannot be extended to other situations unless specifically addressed in writing within the RFI or in a separate RFI.

7.4.1.4 RFI’s should provide a proposed solution and should adequately describe the problem that has arisen.

7.4.2 Scope

The RFI shall reference all the applicable Contract Documents including Specification section, detail, page numbers, Drawing numbers, and sheet numbers, etc. The Contractor shall make suggestions and interpretations of the issue raised by the RFI. An RFI cannot modify the Contract Cost, Contract Time, or the Contract Documents.

7.4.3 Response Time

The Architect must respond to a RFI within a reasonable time after receiving such request. If the Architect’s response results in a change in the Work, then such change shall be effected by a written CO, COR RFP or ICD, if appropriate. If the Architect cannot respond to the RFI within a reasonable time, the Architect shall notify the Contractor, with a copy to the Inspector and the District, of the amount of time that will be required to respond.

7.4.4 Costs Incurred

The Contractor shall be responsible for any costs incurred for professional services as more fully set forth in Article 4.5, which shall be subject to a Deductive Change Order, if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request. District, at its sole discretion, shall issue a Deductive Change Order to Contractor for all such professional services arising from this Article.

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7.5 REQUEST FOR PROPOSAL (“RFP”)

7.5.1 Definition

A RFP is a written request prepared by the Architect (and/or CM) requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change on the Contract Price and (if applicable) the Contract Time. If Architect issues a Bulletin, the Changed items in the Bulletin shall be addressed as an RFP and all responses shall be prepared to a Bulletin as addressed in this Article 7.5. A form RFP is included in the Division 1 documents.

7.5.2 Scope

A RFP shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required by Article 7.7. The Contractor shall not be entitled to any Additional Compensation for preparing a response to an RFP, whether ultimately accepted or not.

7.5.3 Response Time

Contractor shall respond to an RFP within ten (10) days or the time period otherwise set forth in the RFP.

7.6 CHANGE ORDER REQUEST (“COR”)

7.6.1 Definition

A COR is a written request prepared by the Contractor supported by backup documentation requesting that the District and the Architect issue a CO based upon a proposed change, cost, time, or cost and time that may be incurred on the Project or arising from an RFP, ICD, or CCD.

7.6.2 Changes in Price

A COR shall include breakdowns per Article 7.7 to validate any change in Contract Price due to proposed change or Claim.

7.6.3 Changes in Time

A COR shall also include any additional time required to complete the Project only if the delay is a critical path delay. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Project Schedule as defined in Article 8. A schedule fragnet showing the time delay must be submitted with the COR. Any changes in time will be granted only if there is an impact to the critical path. If Contractor fails to request a time extension in a COR, then the Contractor is thereafter precluded from requesting or claiming a delay.

7.7 COST OF CHANGE ORDERS

7.7.1 Scope

Within ten (10) days after a request is made for a change that impacts the Contract Sum as defined in Article 9.1, the critical path, or the Contract Time as defined in Article 8.1.1, the Contractor shall

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provide the District and the Architect, with a written estimate of the effect of the proposed CO upon the Contract Sum and the actual cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing actual quantities, hours, unit prices, and wage rates required for the change, and the effect upon the Contract Time of such CO. Changes may be made by District by an appropriate written CO, or, at the District's option, such changes shall be implemented immediately upon the Contractor's receipt of an appropriate written Construction Change Document.

District may, as provided by law and without affecting the validity of this Agreement, order changes, modification, deletions and extra work by issuance of written CO or CCD from time to time during the progress of the Project, Contract Sum being adjusted accordingly. All such Work shall be executed under conditions of the original Agreement except that any extension of time caused thereby shall be adjusted at time of ordering such change. District has discretion to order changes on a "time and material" basis with adjustments to time made after Contractor has justified through documentation the impact on the critical path of the Project.

7.7.1.1 *Time and Material Charges.* If the District orders Work on a "time and material" basis, timesheets shall be signed daily by the Inspector or District Representative at or near the time the Work is actually undertaken and shall show the hours worked, and the Work actually completed. No time sheets shall be signed the next day. A copy shall be provided to the Person signing the document at the time the document is signed, but not before 10 am the following day.

7.7.2 Determination of Cost

The amount of the increase or decrease in the Contract Price from a CO or COR, if any, shall be determined in one or more of the following ways as applicable to a specific situation:

- a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation. If an agreement cannot be reached within fifteen (15) days after submission and negotiation of Contractor's proposal, Contractor may submit pursuant to Article 7.7.3. Submission of sums which have no basis in fact are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq.);
 1. If the District objects to 7.7.2a) as a method for submission due to inaccuracies in the submitted amount, overstatement of manpower or time required to perform the CO, or unreliability of the data provided, the District may either have the Architect or a professional estimator determine the cost for the CO, and the applicable time extension, or the Contractor shall utilize Article 7.7.2(d) or 7.7.3.
 2. Once the District provides a written objection to use of Article 7.7.2(a) due to unreliability of the estimated price, the Contractor shall no longer utilize mutual acceptance of a lump sum as a method for submission of CO's and shall provide a breakdown of estimated or actual costs pursuant to Article 7.7.2d) or 7.7.3.
- b. By unit prices contained in Contractor's original bid and incorporated in the Project documents or fixed by subsequent agreement between District and Contractor;

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- c. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee. However, in the case of disagreement, Contractor must utilize the procedure under Article 7.7.3; or
- d. By cost of material and labor and percentage of overhead and profit. If the value is determined by this method the following requirements shall apply:

1. *Basis for Establishing Costs*

- (1) Labor will be the cost for wages prevailing locally for each craft or type of workers at the time the extra Work is done, plus employer payments of payroll taxes and workers compensation insurance (exclude insurance costs as part of the overhead and profit mark-up), health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. In no case shall the total labor costs exceed the applicable prevailing wage rate for that particular classification. The use of a labor classification which would increase the extra Work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.
- (2) Materials shall be at invoice or lowest current price at which such materials are locally available and delivered to the Site in the quantities involved, plus sales tax, freight, and delivery. The District reserves the right to approve materials and sources of supply or to supply materials to the Contractor if necessary for the progress of the Work. No markup shall be applied to any material provided by the District.
- (3) Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of \$250 or less.

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates prevailing locally at equipment rental agencies or distributors at the time the Work is performed. Rates applied shall be appropriate based on actual equipment need and usage. Monthly, weekly or other extended use rates that results in the lowest cost shall be applied if equipment is used on site for extended periods.

The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Necessary loading and transportation costs for equipment used on the extra Work shall be included. If equipment is used intermittently and,

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when not in use, could be returned to its rental source at less expense to the District than holding it at the Work Site, it shall be returned unless the Contractor elects to keep it at the Work Site at no expense to the District.

All equipment shall be acceptable to the Inspector, in good working condition, and suitable for the purpose for which it is to be used. Manufacturer’s ratings and modifications shall be used to classify equipment, and equipment shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

If tool and equipment charges are part of a Dispute or Claim, the District reserves the right to utilize actual costs for tools and equipment or a depreciation rate for equipment based on audit finding under Article 13.11 and deduct any rental charges that exceed actual or depreciated costs.

- e. Other Items. The District may authorize other items which may be required on the extra work. Such items include labor, services, material, and equipment which are different in their nature from those required by the Work, and which are of a type not ordinarily available from the Contractor or any of the Subcontractors. Invoices covering all such items in detail shall be submitted with the request for payment.
- f. Invoices. Vendors’ invoices for material, equipment rental, and other expenditures shall be submitted with the COR. If the request for payment is not substantiated by invoices or other documentation, the District may establish the cost of the item involved at the lowest price which was current at the time of the Daily Report.
- g. Overhead. Overhead, including direct and indirect costs, shall be submitted with the COR and include: field overhead, home office overhead, off-site supervision, CO preparation/negotiation/research, time delays, Project interference and disruption, additional guaranty and warranty durations, on-site supervision, additional temporary protection, additional temporary utilities, additional material handling costs, liability and property damage insurance, and additional safety equipment costs.

7.7.3 Format for COR or CO’s

The following format shall be used as applicable by the District and the Contractor to communicate proposed additions to the Contract. All costs submitted shall be actual costs and labor shall be unburdened labor. Refer to Division 1 for a copy of the Construction Change Order form.

	<u>EXTRA</u>	<u>CREDIT</u>
(a) Material (attach itemized quantity and unit cost plus sales tax)	_____	_____
(b) Labor Not to Exceed Applicable Prevailing Wage Rates (attach itemized hours and rates)	_____	_____
(c) Equipment (attach invoices)	_____	_____
(d) Subtotal	_____	_____

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		<u>EXTRA</u>	<u>CREDIT</u>
(e)	If Subcontractor performed work, add Subcontractor's overhead and profit to portions performed by Subcontractor, not to exceed 10% of item (d).		
		<hr/>	
(f)	Subtotal		
(g)	Contractor's Overhead and Profit: Not to exceed 10% of Item (d) if Contractor performed the work. No more than 5% of Item (d) if Subcontractor performed the work. If work was performed by Contractor and Subcontractors, portions performed by Contractor shall not exceed 10% of Item (d), and portions performed by Subcontractor shall not exceed 10% of Item (d)		
(h)	Subtotal		
(i)	Bond not to exceed one percent (1%) of Item (h)		
(k)	TOTAL		
(l)	Time/ Days		

The undersigned Contractor approves the foregoing Change Order or Immediate Change Directive as to the changes, if any, and the Contract price specified for each item and as to the extension of time allowed, if any, for completion of the entire Work on account of said Change Order or Immediate Change Directive, and agrees to furnish all labor, materials and service and perform all Work necessary to complete any additional Work specified therein, for the consideration stated herein. It is understood that

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said Change Order or Immediate Change Directive shall be effective when approved by the Governing Board of the District.

It is expressly understood that the value of such extra Work or changes, as determined by any of the aforementioned methods, expressly includes any and all of the Contractor's costs and expenses, both direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages or time extensions not included are deemed waived.

The Contractor expressly acknowledges and agrees that any change in the Work performed shall not be deemed to constitute a delay or other basis for claiming additional compensation based on theories including, but not limited to, acceleration, suspension or disruption to the Project.

7.7.3.1 *Adjustment for Time and Compensable Delay.* A CO shall also include any additional time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Project Schedule as defined in Article 8 of the General Contract. A schedule fragnet showing the time delay must be submitted with the CO. Any changes in time will be granted only if there is an impact to the critical path. If Contractor fails to request a time extension in a CO, then the Contractor is thereafter precluded from requesting or claiming a delay.

7.7.4 Deductive Change Orders

All Deductive Change Order(s) must be prepared utilizing the form under Article 7.7.3 (a) – (d) only, setting forth the actual costs incurred. Except in the case of an Article 2.2 or 9.6 Deductive Change Order where no mark-up shall be allowed, Contractor will be allowed a maximum of 5% total profit and overhead.

For unilateral Deductive Change Orders, or where credits are due from Contractor for Allowances, Deductive Items, Inspection, Damage, DSA CCD review costs, Architect or Inspector costs for after hours or corrective services, Work removed from the Agreement under Article 2.2 or Article 9.6, there shall be no mark-up.

District may any time after a Deductive Change Order is presented to Contractor by District for items under Article 2.2 or Article 9.6 of if there is disagreement as to the Deductive Change Order, issue a unilateral Deductive Change Order on the Project and deduct the Deductive Change Order from a Progress Payment, Final Payment, or Retention.

7.7.5 Discounts, Rebates, and Refunds

For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor's cost in determining the actual cost of construction for purposes of any change, addition, or omissions in the Work as provided herein. All CO's are subject to Audit under Article 13.11 for discounts, rebates and refunds.

7.7.6 Accounting Records

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With respect to portions of the Work performed by CO's and CCD's on a time-and-materials, unit-cost, or similar basis, the Contractor shall keep and maintain cost-accounting records in a format consistent with accepted accounting standards and satisfactory to the District, which shall be available to the District on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents.

Any time and material charges shall require Inspector's signature on time and material cards showing the hours worked and the Work actually completed. See Article 7.7.1.1.

7.7.7 Notice Required

If the Contractor desires to initiate a Dispute or Claim for an increase in the Contract Price, or any extension in the Contract Time for completion, Contractor shall notify the applicable party responsible for addressing the Dispute or Claim pursuant to Article 4.6. No Claim or Dispute shall be considered unless made in accordance with this subparagraph. Contractor shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such Claim shall be authorized by a CO.

7.7.8 Applicability to Subcontractors

Any requirements under this Article 7 shall be equally applicable to CO's, COR's or ICD's issued to Subcontractors by the Contractor to the same extent required by the Contractor.

7.7.9 Alteration to Change Order Language

Contractor shall not alter or reserve time in COR's, CO's or ICD's. Contractor shall execute finalized CO's and proceed under Article 7.7.7 and Article 4.6 with proper notice. If Contractor intends to reserve time without an approved CPM schedule prepared pursuant to Article 8 or without submitting a fragnet showing delay to critical path, then Contractor may be prosecuted pursuant to the False Claim Act.

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ARTICLE 8 TIME AND SCHEDULE

8.1 DEFINITIONS

8.1.1 Contract Time

Contractor shall perform and reach Substantial Completion (See Article 1.1.46) within the time specified in the Agreement Form. Moreover, Contractor shall perform its Work in strict accordance with the Project Milestones in the Contract Documents and shall proceed on a properly developed and approved Baseline Schedule, which represents the Contractor's view of the practical way in which the Work will be accomplished. Note that Contract Time includes and incorporates all Float and other Baseline inclusions as noted in Article 8.3.2.1 and as otherwise specifically noted in Article 8.

8.1.2 Notice to Proceed

District may give a Notice to Proceed within ninety (90) days of the award of the bid by District. Once Contractor has received the notice to proceed, Contractor shall complete the Work in the period of time referenced in the Contract Documents.

In the event that District desires to postpone the giving of the Notice to Proceed beyond this three-month period, it is expressly understood that with reasonable notice to the Contractor, the giving of the date to proceed may be postponed by District. It is further expressly understood by Contractor, that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the giving of the notice to proceed

If the Contractor believes that a postponement will cause a hardship to Contractor, Contractor may terminate the Contract with written notice to District within 10 days after receipt by Contractor of District's notice of postponement. It is further understood by Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and the grounds for notification and hardship shall be subject to Audit pursuant to Article 13.11. Should Contractor terminate the Contract as a result of a notice of postponement, District may award the Contract to the next lowest responsible bidder.

8.1.3 Computation of Time

The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.1.4 Float

Float is time the total number of days an activity may be extended or delayed without delaying the Completion Date shown in the schedule. Float will fall into three categories: (1) Rain Days; (2) Governmental Delays; and, (3) Project Float. Project Float and Rain Days are owned by the Project and may be utilized as necessary for critical path delays once the days become available for consumption (i.e. the Rain Day arrives and is not utilized since rain did not occur or Work was performed on the interior of a building). However, Governmental Delay float shall not be utilized for purposes other than to address critical path delays that arise due to approvals, Inspector approvals or verifications on governmental forms.

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8.1.4.1 *Governmental Delay Float.* It is anticipated that there will be governmental generated delays. Specific to DSA approvals, it is anticipated that no less than twelve (12) days per calendar year shall be set aside as Governmental Float to be utilized on critical path delays. A pro-rated number of days shall be calculated based on length of Contract Time. (For example, a two (2) year Contract Time shall require twenty-four (24) days of Governmental Float. If the Contract Time is 182 days, then the Contract Time shall require six (6) days of Governmental Float) This Governmental Delay float must be incorporated into the schedule and should be incorporated in each critical activity as Contractor deems fit. Specifically, major categories of Work under the DSA 152 (Project Inspection Card) should be allocated Governmental Delay Float at the Contractor's discretion. Governmental Delay Float on the Project may exceed 12 days per one (1) year period, but Contractor is required to include not be less than 12 days of Governmental Delay Float during each one (1) year period.

Contractor's failure to establish a protocol for requesting inspections is not grounds to utilize Governmental Delay Float. As noted in Article 3.1.4, 48 hours advance notice of commencing Work on a new area is required after submitting form DSA 156 and under PR 13-01 Special Inspection reports are not required to be posted until at least 14 days after the Work was inspected. Failure to plan, and pay (if applicable) for quicker delivery of Special Inspections is not Governmental Delay Float under Article 8.1.4.1. If Governmental Delay Float is not utilized, this float is carried through to other DSA 152 categories of inspection and consumed over the course of the Project

Governmental Delay Float may be utilized for a DSA Stop Work Order regardless of fault as defined under Education Code section 81133.5.

8.1.4.2 *Inclement Weather (Rain Days).* The Contractor will only be allowed a time extension for unusually severe weather if it results in precipitation or other conditions which in the amount, frequency, or duration is in excess of the norm at the location and time of year in question as established by NOAA weather data. No less than 22 calendar days for each calendar year for Southern California will be allotted for in the Contractor's schedule for each winter weather period or carried at the end of the schedule as Rain Float. Float for weather days in other geographical regions shall be adjusted based on NOAA weather data for the geographical location. Contractor has anticipated all the days it takes to dry out and re-prepare areas that may be affected by weather delays which extend beyond the actual weather days. The weather days shall be shown on the schedule and if not used will become float for the Project's use. The Contractor will not be allowed a day-for-day weather delay for periods noted as float in the Schedule. The Contractor is expected to work seven (7) days per week (if necessary, irrespective of inclement weather), to maintain access, and to protect the Work under construction from the effects of inclement weather. Additional days beyond the NOAA shall be considered under the same criteria that weather days are granted below.

A Rain Day shall be granted by Architect or CM if the weather prevents the Contractor from beginning Work at the usual daily starting time, or prevents the Contractor from proceeding with seventy-five (75%) of the normal labor and equipment force towards completion of the day's current controlling item on the accepted schedule for a period of at least five hours, and the crew is dismissed as a result thereof, the Architect will designate such time as unavoidable delay and grant one (1) critical path activity calendar-day extension if there is no available float for the calendar year.

8.1.4.3 *Project Float.* The Contractor may determine some activities require a lesser duration than allocated and may set aside float in the Project Schedule. There shall be no early completion. Instead, to the extent float is either addressed at the end of the Project or throughout each category of critical path work, Project float may be used as necessary during the course of the Project and allocated on a first,

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come first serve basis. However, the use of float does not extend to Governmental Delay Float, which shall only be used for Governmental Delays.

8.2 HOURS OF WORK

8.2.1 Sufficient Forces

Contractors and Subcontractors shall continuously furnish sufficient forces to ensure the prosecution of the Work in accordance with the Construction Schedule.

8.2.2 Performance During Working Hours

Work shall be performed during regular working hours as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the District and approval of any required governmental agencies.

8.2.3 Costs for After Hours Inspections

If the Work done after hours is required by the Contract Documents, a Recovery Schedule, or as a result of the Contractor's failure to plan, and inspection must be conducted outside the Inspector's regular working hours, the costs of any after hour inspections, shall be borne by the Contractor.

If the District allows the Contractor to do Work outside regular working hours for the Contractor's convenience, the costs of any inspections required outside regular working hours shall be invoiced to the Contractor by the District and a Deductive Change Order shall be issued from the next Progress Payment.

If the Contractor elects to perform Work outside the Inspector's regular working hours, costs of any inspections required outside regular working hours shall be invoiced to the Contractor by the District and a Deductive Change Order from the next Progress Payment as a Deductive Change Order.

8.3 PROGRESS AND COMPLETION

8.3.1 Time of the Essence

Time limits stated in the Contract Documents are of the essence to the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.3.2 Baseline Schedule Requirements

8.3.2.1 *Timing:* Within ten (10) calendar days after Notice to Proceed, Contractor shall submit a practical schedule showing the order in which the Contractor proposes to perform the Work, and the dates on which the Contractor contemplates starting and completing the salient categories of the Work. This first schedule which outlines the Contractor's view of the practical way in which the Work will be accomplished is the Baseline Schedule. If the Contractor Fails to submit the Baseline Schedule within the ten (10) days noted, then District may withhold processing and approval of progress payments pursuant to Article 9.4 and 9.6.

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8.3.2.2 *District Review and Approval:* District, Architect and CM will review both a paper and electronic copy of Baseline Schedule and may provide comments as noted in this Article and either approve or disapprove the Baseline Schedule. All Schedules shall be prepared using an electronic scheduling program acceptable to District. All Schedules shall be delivered in an electronic format usable by the District. All logic ties and electronic information shall be included in the electronic copy of the Baseline Schedule that is delivered to the District.

8.3.2.3 *Schedule Must Be Within the Given Contract Time.* The Baseline Schedule shall not exceed time limits set forth in the Contract Documents and shall comply with all of the scheduling requirements as set forth in the Specifications and Contract Documents.

8.3.2.4 *Submittals Must Be Incorporated (See Articles 3.7 and 3.9):* Contractor shall include Submittals as line items in the Baseline Schedule as required under Article 3.7.2 and 3.9.6. Submittals shall not delay the Work, Milestones, or the Completion Date. Failure to include Submittals in the Baseline Schedule shall be deemed a material breach by the Contractor.

8.3.2.5 *Float Must Be Incorporated.* The Baseline Schedule must indicate the beginning and completion of all phases of construction and shall use the “critical path method” (commonly called CPM) for the value reporting, planning and scheduling, of all Work required under the Contract Documents. The Baseline Schedule must incorporate all Milestones in the Project and apply Governmental Float at each Milestone in the Contractor’s discretion. The Baseline Schedule shall incorporate any Schedule provided by the District as part of the bid and shall note durations that will not be adequate or should be shortened based on Contractor’s review. These changes shall be identified and incorporated into Contractor’s Baseline Schedule as long as requested changes are made within 10 days after the District chooses to move forward with the Project. Scheduling is necessary for the District’s adequate monitoring of the progress of the Work and shall be prepared in accordance with the time frame described in this Article 8. The Architect may disapprove of any Schedule or require modification to it if, in the opinion of the Architect or District, adherence to the any Schedule prepared by the Contractor will not cause the Work to be completed in accordance with the Agreement.

8.3.2.6 *No Early Completion.* Contractor shall not submit any Schedule showing early completion without indicating float time through the date set for Project completion by District. Contractor’s Baseline Schedule shall account for all days past early completion as float which belongs to the Project. Usage of float shall not entitle Contractor to any delay Claim or damages due to delay.

8.3.2.7 *Use of Schedule Provided in Bid Documents.* In some cases, the bid will include a preliminary schedule indicating Milestones and construction sequences for the Project along with general timing for the Project. The preliminary schedule is not intended to serve as the Baseline Schedule utilized for construction. It is up to the Contractor to study and develop a Baseline Schedule to address the actual durations and sequences of Work that is anticipated while maintaining the Milestones provided by the District. Contract shall obtain information from Contractor’s Subcontractors and vendors on the planning, progress, delivery of equipment, coordination, and timing of availability of Subcontractors so a practical plan of Work is fully developed and represented in the Baseline Schedule.

8.3.2.8 *Incorrect Logic, Durations, Sequences, or Critical Path.* The District may reject or indicate durations, sequences, critical path or logic are not acceptable and request changes. The electronic copy of the Baseline Schedule shall have adequate information so logic ties, duration, sequences and critical path may be reviewed electronically. Contractor is to diligently rebuild and resubmit the Baseline Schedule to represent the Contractor’s plan to complete the Work and maintain Milestones at the next progress meeting, or before the next progress meeting. If Contractor is not able to build a Baseline

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Schedule that is acceptable to the District or Architect, the District reserves the right to utilize the unapproved originally submitted Baseline Schedule (See Article 8.3.2.12) and the comments submitted to hold Contractor accountable for timely delivery of Work and maintenance of Milestones. Furthermore, Contractor's representations in the Baseline Schedule, if unacceptable, may also be used as a basis for termination of the Contract under Article 14 if Contractor fails to adequately maintain the Schedule and falls significantly behind without undertaking the efforts to either submit and follow a Recovery Schedule or fail to submit a Recovery Schedule and make no effort toward recovery on the Project.

8.3.2.9 *Contractor Responsibility Even if Schedule Issues Are Not Discovered.* Failure on the Part of the District to discover errors or omissions in any Schedules submitted shall not be construed to be an approval of the error or omission and any flawed Schedule is not grounds for a time extension.

8.3.2.9.1 Inclusions in Baseline Schedule. In addition to scheduling requirements set forth at Article 8.3.2, Contractor is specifically directed to include (broken out separately) in Contractor's Baseline Schedule and all Schedule updates, the following items required pursuant to these General Conditions, including but not limited to:

1. Rain Day Float (excluding inclement weather) as required under Article 8.1.4.2. For example, if the NOAA provides 22 days of Rain Days, all 22 days must be incorporated and noted in the Baseline Schedule. Further, any days required to clean-up or dry out shall be included for operations that are likely to require a clean-up or dry out period. Days that are not utilized shall be considered float owned by the Project.
2. Governmental Delay Float under Article 8.1.4.1. This Governmental Delay Float shall only be utilized for Governmental Delays and shall not be considered available float owned by the Project. This float shall only be distributed to the Project upon the completion of the Project and shall be used to offset Liquidated Damages and shall not generate compensable delays.
3. Submittal and Shop Drawing schedule under Article 3.9.
4. Deferred Approvals under Article 3.9.
5. Time for separate contractors, including furniture installation and start up activities, under Article 6.1.
6. Coordination and timing of any Drawings, approvals, notifications, permitting, connection, and testing for all utilities for the Project. Article 2.1.4
7. Testing, special events, or school activities

8.3.2.10 *Failure to include Mandatory Schedule Items.* District may withhold payment pursuant to Articles 9.3, 9.4 and 9.6. In lieu of withholding payment for failure to include Mandatory Schedule Items, after the District or Architect has notified the Contractor of failure to meet the Baseline Schedule or Updated Schedule requirements and provided a written notification of this failure and provided a written notice of Schedule preparation errors, and the Contractor fails to correct the noted deficiencies or

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the Contractor does not provide an updated Baseline Schedule correcting the deficiencies, then Contractor shall not be granted an extension of time for failure to obtain necessary items and approvals under Article 8.3.2 and for the time required for failure to comply with laws, building codes, and other regulations (including Title 24 of the California Code of Regulations). Contractor shall maintain all required Article 8.3.2 Schedule items in the Baseline Schedule and indicate any days that have been used as allowed in Article 8. If Contractor fails to include all Article 8.3.2 items in its Baseline Schedule or Schedule Updates and the District either utilizes an Unapproved Schedule under Article 8.3.2.12 or does not object to the inclusion of required scheduling items, then all mandatory Schedule inclusions, including float, shall be utilized in the District's discretion. If the Contract Time is exceeded, then Contractor shall be subject to the assessment of Liquidated Damages pursuant to Article 8.4.

8.3.2.11 *Failure to Meet Requirements.* Failure of the Contractor to provide proper Schedules as required by this Article and Article 9 is a material breach of the Contract and grounds for Termination pursuant to Article 14. The District, at its sole discretion, may choose, instead, to withhold, in whole or in part, any Progress Payments or Retention amounts otherwise payable to the Contractor.

8.3.2.12 *Use of an Unapproved Baseline Schedule.* If the Baseline Schedule submitted by the Contractor is unacceptable to the District (i.e. failing to meet the requirements of Article 8.3.2) and Contractor does not incorporate or address the written comments to the Baseline Schedule and a Baseline Schedule is not approved, but due to extreme necessity, the District moves forward without an approved Baseline Schedule, Contractor shall diligently revise and meet Schedule update requirements of Article 8 and incorporate all Article 8.3.2 comments in all updates). However, for purposes of Termination pursuant to Article 14, the unapproved Baseline Schedule initially submitted shall be treated as the Baseline Schedule with durations shortened or revised to accommodate all float, all mandatory Schedule requirements under Article 8.3.2, any requirements in the Contract Documents, and all revisions by the District or Architect.

8.3.3 Update Schedules

8.3.3.1 *Updates Shall Be Based on Approved Baseline Schedule.* Except in the case where there has not been agreement as to a Baseline Schedule, the approved Baseline Schedule shall be used to build future Schedule updates. Schedule updates shall be a CPM based Schedule consistent with the Baseline Schedule requirements of 8.3.2

In the case that no Baseline has been approved, Schedule updates shall be provided monthly and each update shall incorporate all comments and revisions noted as not complying with the requirements of Article 8.3.2. Contractor shall be held to the Article 8.3.2.12 unapproved Baseline Schedule, inclusive of all Milestones, float, comments and revisions by the District and Architect, all required Baseline Schedule Inclusions under Article 8.3.2, and any requirements in the Contract Documents.

8.3.3.2 *Schedule Updates.* Contractor shall update the approved Schedule each month to address actual start dates and durations, the percent complete on activities, actual completion dates, estimated remaining duration for the Work in progress, estimated start dates for Work scheduled to start at future times and changes in duration of Work items

8.3.3.3 *Listing of Items Causing Delays.* Schedule updates shall provide a listing of activities which are causing delay in the progress of Work and a narrative shall be provided showing a description of problem areas, anticipated delays, and impacts on the Construction Schedule. Simply stating "District Delay" or "Architect Delay" shall be an inadequate listing. Delays shall only be listed if they meet the requirements of Article 8.4.

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8.3.3.4 *Recovery Schedule*. In addition to providing a schedule update every thirty (30) days, the Contractor, if requested by the Architect or District, shall take the steps necessary to improve Contractor's progress and demonstrate to the District and Architect that the Contractor has seriously considered how the lost time, the Completion Date, or the Milestones that are required to be met within the terms of the Contract. Contractor shall immediately provide a Recovery Schedule showing how Milestones and the Completion Date will be met. In no case, shall a Recovery Schedule be provided later than ten (10) days following the request for a Recovery Schedule from the Architect or District.

- a. Failure to Provide a Recovery Schedule. Shall subject Contractor to the assessment of Liquidated Damages for failure to meet the Contract Time. Refusal or failure to provide a Recovery Schedule shall be considered a substantial failure of performance and a material breach of Contract and may result in Termination of the Contract pursuant to Article 14.
- b. Recovery Schedule Acceleration without Additional Cost. The District may require Contractor prepare a Recovery Schedule showing how the Project shall be accelerated, without any additional cost to the District. The District may order, without additional cost, the following:
 1. Increase the number of shifts;
 2. Utilize overtime to recover the approved Schedule; and/or
 3. Increase the days when Work occurs, including weekends, at the Project and at any manufacturer's plant.
- c. Recovery Schedule Acceleration without Additional Cost. If Contractor disputes that the Recovery Schedule acceleration shall be issued without additional costs, the Contractor shall submit concurrent with Recovery Schedule acceleration notice pursuant to Articles 8.4.3 and 8.4.4.

8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES

8.4.1 Liquidated Damages

CONTRACTOR AND DISTRICT HEREBY AGREE THAT THE EXACT AMOUNT OF DAMAGES FOR FAILURE TO COMPLETE THE WORK WITHIN THE TIME SPECIFIED IS EXTREMELY DIFFICULT OR IMPOSSIBLE TO DETERMINE. IF THE WORK IS NOT SUBSTANTIALLY COMPLETED IN THE TIME SET FORTH IN THE AGREEMENT, IT IS UNDERSTOOD THAT THE DISTRICT WILL SUFFER DAMAGES. IT BEING IMPRACTICAL AND UNFEASIBLE TO DETERMINE THE AMOUNT OF ACTUAL DAMAGE, IT IS AGREED THE CONTRACTOR SHALL PAY TO THE DISTRICT THE AMOUNT LIQUIDATED DAMAGES SET FORTH IN THE AGREEMENT, FOR EACH CALENDAR DAY OF DELAY IN REACHING SUBSTANTIAL COMPLETION (SEE ART 1.1.46). CONTRACTOR AND ITS SURETY SHALL BE LIABLE FOR THE AMOUNT THEREOF PURSUANT TO GOVERNMENT CODE SECTION 53069.85.

8.4.2 Delay

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Except and only to the extent provided under Article 7 and Article 8, by signing the Agreement, Contractor agrees to bear the risk of delays to Completion of the Work and that Contractor's bid for the Project was made with full knowledge of this risk.

In agreeing to bear the risk of delays to complete the Work, Contractor understands that, except and only to the extent provided otherwise in Article 7 and 8, the occurrence of events that delay the Work shall not excuse Contractor from its obligation to achieve Completion of the Project within the Contract Time, and shall not entitle the Contractor to an adjustment to the Contract time.

8.4.3 Excusable Delay

Contractor shall not be charged for Liquidated Damages because of any delays in completion of Work which are not the fault or negligence of Contractor or its Subcontractors, arising from Rain Float or Project Float, including acts of God, as defined in Public Contract Code section 7105, acts of enemy, epidemics and quarantine restrictions. Any approved delays caused by acts of God, as defined in Public Contract Code section 7105, acts of enemy, epidemics, pandemics, and quarantine restrictions (collectively, "Force Majeure Events") shall be deemed non-compensable excusable delays. Contractor shall within five (5) calendar days of beginning of any such delay notify Owner in writing of causes of delay; thereupon Owner shall ascertain the facts and extent of delay and grant extension of time for completing Work when, in its judgment, the findings of fact justify such an extension. Extensions of time shall apply only to that portion of Work affected by delay, and shall not apply to other portions of Work not so affected. An extension of time may only be granted after proper compliance with Article **Error! Reference source not found.** requiring preparation and submission of a properly prepared CPM schedule.

8.4.3.1 *Excusable Delay Is Not Compensable.* No extended overhead, general conditions costs, impact costs, out-of-sequence costs or any other type of compensation, by any name or characterization, shall be paid to the Contractor for any delay to any activity not designated as a critical path item on the latest approved Project schedule or if caused by Force Majeure Events.

8.4.3.2 *Notification.* The Contractor shall notify the Architect in writing of any anticipated delay and its cause, in order that the Architect may take immediate steps to prevent, if possible, the occurrence or continuance of delay, and may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the Work might be delayed thereby.

8.4.3.3 *Extension Request.* In the event the Contractor requests an extension of Contract time for unavoidable delay, such request shall be submitted in accordance with the provisions in the Contract Documents governing changes in Work (See Article 7). When requesting time, i.e., extensions, for proposed Change Orders, they must be submitted with the proposed Change Order with full justification and documentation. If the Contractor fails to submit justification with the proposed Change Order it waives its right to a time extension at a later date. Such justification must be based on the official Contract schedule as updated at the time of occurrence of the delay or execution of Work related to any changes to the scope of Work. Blanket or general claims for extra days without specific detailed information as required herein or a blanket or general reservation of rights do not fulfill the requirements of this Article and shall be denied. The justification must include, but is not limited to, the following information:

- a. The duration of the activity relating to the changes in the Work and the resources (manpower, equipment, material, etc.) required to perform these activities within the stated duration.

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- b. Logical ties to the official Baseline Schedule or Approved Updated Schedule for the proposed changes and/or delay showing the activity/activities in the schedule whose start or completion dates are affected by the change and/or delay. (A fragment of any delay of over ten (10) days must be provided.)

The Contractor and District understand and expressly agree that insofar as Public Contract Code section 7102 may apply to changes in the Work or delays under this Contract, the actual delays and damages, if any, and time extensions are intended to, and shall provide, the exclusive and full method of compensation for changes in the Work and construction delays.

8.4.4 Notice by Contractor Required

The Contractor shall within five (5) calendar days of beginning of any such delay notify the District in writing of causes of delay with justification and supporting documentation. In the case of a Recovery Schedule pursuant to Article 8.3.3.4, Contractor shall submit written notice concurrent with the Recovery Schedule. District will then ascertain the facts and extent of the delay and grant an extension of time for completing the Work when, in its judgment, the findings of fact justify such an extension. Extensions of time shall apply only to that portion of the Work affected by the delay and shall not apply to other portions of the Work not so affected.

Claims relating to time extensions shall be made in accordance with applicable provisions of Article 7.

8.4.4.1 *Adjustment for Compensable Delays.* The Schedule may be adjusted for a delay if, and only if, Contractor undertakes the following:

- a. Contractor submits a timely COR or CO pursuant to the requirements of Article 7.
- b. Contractor submits a fragnet showing the critical path delay caused by the COR, CO, Changed Condition, CCD, or ICD
- c. Contractor has addressed all required float days in the Fragnet.
- d. Contractor submits a complete breakdown of all costs incurred utilizing the format of Article 7.3.3

8.4.5 No Additional Compensation for Coordinating Governmental Submittals and the Resulting Work

CONTRACTOR HAS PLANNED ITS WORK AHEAD OF TIME AND IS AWARE THAT GOVERNMENTAL AGENCIES, SUCH AS THE GAS COMPANIES, ELECTRICAL UTILITY COMPANIES, WATER DISTRICTS AND OTHER AGENCIES MAY HAVE TO APPROVE CONTRACTOR PREPARED DRAWINGS OR APPROVE A PROPOSED INSTALLATION. CONTRACTOR HAS INCLUDED DELAYS AND DAMAGES WHICH MAY BE CAUSED BY SUCH AGENCIES IN CONTRACTOR'S BID AND HAS INCLUDED ADEQUATE TIME IN THE CONTRACTOR'S BASELINE SCHEDULE. FAILURE TO ADEQUATELY PLAN AND SCHEDULE IS NOT A BASIS TO USE GOVERNMENTAL DELAY FLOAT.

8.4.6 District Right to Accelerate the Work

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The District may direct the Contractor to meet schedule requirements when the Work has been delayed. The District shall compensate the Contractor for the additional costs incurred by acceleration to the extent that such costs are directly attributable to the acceleration and are incurred through no fault or negligence of the Contractor.

8.4.6.1 *Management of Acceleration.* Contractor acceleration shall not include Work that is part of the scope of Work detailed in the Plans and Specifications. Instead, the acceleration costs shall be premium or overtime and quantifiable additional work added to the Project meant to accelerate the Project. Contractor is directed to keep consistent crews on the Project so time can be tracked. If crews are circulated off the Project or crews brought in only for overtime, the District may be charged for Contract Work and not accelerated time. In such case, the District may object to the costs submitted.

8.4.6.2 *Costs for Acceleration.* Cost for Acceleration shall be supported by backup documentation, and time sheets signed by the Inspector for each day work has been performed, at or near the time when the Work was performed. A listing on the time sheet shall document all labor, materials and services utilized that day and provide areas of work, and amount of work performed. Contractor shall comply with submission requirements of Article 7.7.

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ARTICLE 9 PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

The Contract Sum or Contract Price is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents.

9.2 COST BREAKDOWN

9.2.1 Required Information

Contractor shall furnish the following:

- a. Within ten (10) days after Notice to Proceed, a detailed breakdown of the Contract Price (hereinafter “Schedule of Values”) for each Project, Site, building, Milestone or other meaningful method to measure the level of Project Completion as determined by the District shall be submitted as a Submittal for the Project.;
- b. Within ten (10) days after the date of the Notice to Proceed, a schedule of estimated monthly payment requests due the Contractor showing the values and construction time of the various portions of the Work to be performed by it and by its Subcontractors or material and equipment suppliers containing such supporting evidence as to its correctness as the District may require;
- c. Within ten (10) days after the date of the Notice to Proceed, address, telephone number, telecopier number, California State Contractors License number, classification and monetary value of all subcontracts for parties furnishing labor, material, or equipment for completion of the Project.

9.2.2 Information and Preparation of Schedule of Values

9.2.2.1 *Break Down of Schedule of Values.* Schedule of Values shall be broken down by Project, site, building, Milestone, or other meaningful method to measure the level of Project Completion as determined by the District.

9.2.2.2 *Based on Contractor Bid Costs.* The Schedule of Values shall be based on the costs from Contractor’s bid to the District. However, the submission of the Schedule of Values shall not be front loaded so the Contractor is paid a greater value than the value of the Work actually performed and shall not shift funds from parts of the Project that are later to Work that is performed earlier.

9.2.2.3 Largest Dollar Value for Each Line Item. Identify Subcontractors and materials suppliers proposed to provide portions of Work equal to or greater than ten thousand dollars (\$10,000) or one-half of one percent (0.5%) of their Contract Price, whichever is less.

9.2.2.4 *Allowances.* Any Allowances provided for in the Contract shall be a line item in the Schedule of Values.

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9.2.2.5 *Labor and Materials Shall Be Separate.* Labor and Materials shall be broken into two separate line items unless specifically agreed in writing by the District.

9.2.3 District Approval Required

The District shall review all submissions received pursuant to Article 9.2 in a timely manner. All submissions must be approved by the District before becoming the basis of any payment.

9.3 PROGRESS PAYMENTS

9.3.1 Payments to Contractor

Unless there is a resolution indicating that the Work for the Project is substantially complex, within thirty five (35) days after approval of the Request for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as certified by Architect and Inspector and verified by Contractor) up to the last day of the previous month, less the aggregate of previous payments. In the case of a Project designated substantially complex, the sum paid to the Contractor shall be equal to ninety percent (90%) of the value of the Work performed (as certified by the Architect and Inspector and verified by Contractor). The value of the Work completed shall be the Contractor's best estimate. Work completed as estimated shall be an approximation or estimate only and no mistake, inaccuracy, error or falsification in said any approved estimate shall operate to release the Contractor, or any Surety upon any bond, from damages arising from such Work, or from the District's enforcement of each and every provision of this Contract including but not limited to the Performance Bond and Payment Bond. The District shall have the right to subsequently to correct any mistake, inaccuracy, error or falsification made or otherwise set forth in any approved Request for Payment and such correction may occur in any future Payment Application or in the Retention Payment to the Contractor. No Surety upon any bond shall be relieved, released or exonerated of its obligations under this Contract or any applicable bond when the District is unable to correct an overpayment to the Contractor due to any abandonment by the Contractor or termination by the District.

The Contractor shall not be entitled to have any payment requests processed, or be entitled to have any payment made for Work performed, so long as any lawful or proper direction given by the District concerning the Work, or any portion thereof, remains incomplete.

Notwithstanding anything to the contrary stated above, the Contractor may include in its Request for Payment the value of any structural steel, glue laminated beams, trusses, bleachers and other such custom-made materials prepared specifically for the Project and unique to the Project so long as all of the following requirements are satisfied:

- a. The aggregate cost of materials stored off-site shall not exceed Fifty Thousand Dollars (\$50,000) at any time or as otherwise agreed to be District in writing;
- b. Title to such materials shall be vested in the District as evidenced by documentation satisfactory in form and substance to the District, including, without limitation, recorded financing statements, UCC filings and UCC searches;
- c. With each Contractor Request for Payment, the Contractor shall submit to the District a written list identifying each location where materials are stored off-site (which must be a bonded warehouse) and the value of the materials at each location. The Contractor shall procure insurance satisfactory to the District (in its

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reasonable discretion) for materials stored off-site in an amount not less than the total value thereof;

- d. The consent of any Surety shall be obtained to the extent required prior to payment for any materials stored off-site;
- e. Representatives of the District shall have the right to make inspections of the storage areas at any time; and
- f. Such materials shall be: (1) protected from diversion, destruction, theft and damage to the reasonable satisfaction of the District; (2) specifically marked for use on the Project; and (3) segregated from other materials at the storage facility.

9.3.2 Purchase of Materials and Equipment and Cost Fluctuations

The Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to assure that there will be no delays. Contractor understands that materials fluctuate in value and shall have adequately addressed market fluctuations through agreements with Contractor vendors or by other means. Contractor further understands and incorporates into Contractor's bid cost any wage rate increases during the Project for the Contractor's labor force as well as all other Subcontractor and vendor labor forces. District shall not be responsible for market fluctuations in costs or labor rate increases during the Project. Contractor further has incorporated any and all cost increases in areas of Work where there may be schedule variations so that cost increases are not passed through to the District.

9.3.3 No Waiver

No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Contractor specifically understands that Title 24 Section 4-343 which states:

"It is the duty of the contractor to complete the work covered by his or her contract in accordance with the approved Plans and Specifications therefore. The contractor in no way is relieved of any responsibility by the activities of the Architect, Engineer, Inspector or DSA in the performance of such duties... In no case, however, shall the instruction of the Architect or registered Engineer be construed to cause work to be done with is not in conformity with the approved Plans, Specifications, and change orders..."

Notwithstanding any payment, the District may enforce each and every provision of this Contract which includes, but is not limited to, the Performance Bond and Payment Bond. The District may correct any error subsequent to any payment. In no event shall the Contractor or the Surety be released or exonerated from performance under this Contract when the District overpays the Contractor based upon any mistake, inaccuracy, error or falsification in any estimate that is included in any Request for Payment.

9.3.4 Issuance of Certificate of Payment

The Architect shall, within seven (7) days after receipt of the Contractor's Application for Payment, either approve such payment or notify the Contractor in writing of the Architect's reasons for withholding approval in whole or in part as provided in Article 9.6. The review of the Contractor's

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Application for Payment by the Architect is based on the Architect's observations at the Project and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. In some cases, the Architect may act upon or rely on the evaluation of the Work by the Inspector. This review of Payment Applications is sometimes called a "Pencil Draft." District's return of a Pencil Draft shall constitute the District's dispute of the Payment Application that has been submitted. Contractor shall promptly respond to Pencil Drafts or Contractor's Payment Applications may be delayed. Contractor's failure to promptly respond to a Pencil Draft shall qualify as a delay in the prompt payment of a Request for Payment or Request for Retention. The foregoing representations are subject to: (1) an evaluation of the Work for conformance with the Contract Documents, (2) results of subsequent tests and inspections, (3) minor deviations from the Contract Documents correctable prior to completion, and (4) specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute the Contractor's verified representation that the Contractor is entitled to payment in the amount certified.

9.3.5 Payment of Undisputed Contract Payments

In accordance with Public Contract Code section 7100, payments by the District to the Contractor for any and all undisputed amounts (including all Progress Payments, Final Payments or Retention Payment) is contingent upon submission of a proper and accurate Payment Application and the Contractor furnishing the District with a release of all Claims against the District related to such undisputed amounts. Disputed Contract Claims in stated amounts may be specifically excluded by the Contractor from the operation of the release. If, however, the Contractor specifically excludes any Claims, the Contractor shall provide details such as a specific number of disputed days or costs of any such exclusion in accordance with Articles 4.6 and 7.7.

9.4 APPLICATIONS FOR PROGRESS PAYMENTS

9.4.1 Procedure

9.4.1.1 *Application for Progress.* On or before the fifth (5th) day of each calendar month during the progress of the Work, Contractor shall submit to the Architect an itemized Application for Progress Payment for operations completed. Such application shall be notarized, if required, and supported by the following or such portion thereof as Architect requires:

1. The amount paid to the date of the Payment Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;
2. The amount being requested under the Payment Application by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;
3. The balance that will be due to each of such entities after said payment is made;
4. A certification that the As-Built Drawings and Annotated Specifications are current;

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5. Itemized breakdown of Work done for the purpose of requesting partial payment;
6. An updated or approved Baseline Schedule or other Schedule updates in conformance with Article 8;
7. Failure to submit an updated Schedule for the month or any previous month;
8. The additions to and subtractions from the Contract Price and Contract Time;
9. A summary of the Retention held;
10. Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require from time to time;
11. The percentage of completion of the Contractor's Work by line item;
12. An updated Schedule of Values from the preceding Application for Payment;
13. Prerequisites for Progress Payments; and
14. Any other information or documents reasonably requested by the District, Architect, Inspector or CM (if applicable).

9.4.1.2 *First Payment Request.* The following items, if applicable, must be completed before the first payment request will be accepted for processing:

1. Installation of the Project sign;
2. Receipt by Architect of Submittals;
3. Installation of field office;
4. Installation of temporary facilities and fencing;
5. Submission of documents listed in the Article 9.2 relating to Contract Price breakdown;
6. Preliminary schedule analysis, due within 10 days after Notice to Proceed;
7. Contractor's Baseline Schedule (to be CPM based in conformance with Article 8);
8. Schedule of unit prices, if applicable;
9. Submittal Schedule;
10. Copies of necessary permits;

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11. Copies of authorizations and licenses from governing authorities;
12. Initial progress report;
13. Surveyor qualifications;
14. Written acceptance of District's survey of rough grading, if applicable;
15. List of all Subcontractors, with names, license numbers, telephone numbers, and scope of work;
16. All bonds and insurance endorsements; and
17. Resumes of General Contractor's Project Manager, and if applicable, job site secretary, record documents recorder, and job site Superintendent.

9.4.1.3 *Second Payment Request.* The second payment request will not be processed until all Submittals and Shop Drawings have been accepted for review by the Architect.

9.4.1.4 *All Payment Requests.* No payment requests will be processed unless Contractor has submitted copies of the certified payroll records for the Work which correlates to the payment request and a proper CPM schedule pursuant to Article 8 is submitted.

9.4.1.5 *Final Payment Application (90% or 95%).* See Article 9.11.1

9.4.1.6 *Final Payment Application (100%).* See Article 9.11.3

9.5 STOP NOTICE CLAIMS AND WARRANTY OF TITLE

The Contractor warrants title to all Work. The Contractor further warrants that all Work is free and clear of liens, claims, security interests, stop notices, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work. Failure to keep work free of liens, stop notices, claims, security interests or encumbrances is grounds to make a claim against Contractor's Payment and Performance Bond to immediately remedy and defend.

If a lien or stop notice of any nature should at any time be filed against the Work or any District property, by any entity which has supplied material or services at the request of the Contractor, Contractor and Contractor's Surety shall promptly, on demand by District and at Contractor's and Surety's own expense, take any and all action necessary to cause any such lien or stop notice to be released or discharged immediately therefrom.

If the Contractor fails to furnish to the District within ten (10) calendar days after written demand by the District, satisfactory evidence that a lien or stop notice has been so released, discharged, or secured, then District may discharge such indebtedness and deduct the amount required therefor, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor under the Contract. In addition, any liens, stop notices, claims, security interests or encumbrances shall trigger the indemnification requirements under Article 3.15 and the Agreement Form, and shall act as a trigger under Civil Code section 2778 and 2779 requiring reimbursement for any and all costs following the District's written demand has been made. Any withholdings by the District for

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stop notices in accordance with Civil Code section 9358 shall not be a basis by the Contractor to make a Claim for interest penalties under Public Contract Code sections 7107 or 20104.50.

9.6 DECISIONS TO WITHHOLD PAYMENT

9.6.1 Reasons to Withhold Payment

The District may withhold payment in whole, or in part, to the extent reasonably necessary to protect the District if, in the District's opinion, the representations to the District required by Article 9.4 cannot be made. The District may withhold payment, in whole, or in part, to such extent as may be necessary to protect the District from loss because of, but not limited to:

- a. Defective Work not remedied;
- b. Stop notices served upon the District;
- c. Liquidated Damages assessed against the Contractor;
- d. The cost of Completion of the Contract if there exists reasonable doubt that the Work can be Completed for the unpaid balance of any Contract Price or by the completion date;
- e. Damage to the District or other contractor;
- f. Unsatisfactory prosecution of the Work by the Contractor;
- g. Failure to store and properly secure materials;
- h. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, acceptable monthly progress schedules, Shop Drawings, Submittal schedules, Schedule of Values, Product Data and samples, proposed product lists, executed Change Order, Construction Change Documents, and verified reports;
- i. Failure of the Contractor to maintain As-Built Drawings;
- j. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Payment Application;
- k. Unauthorized deviations from the Contract Documents (including but not limited to Unresolved Notices of Deviations (DSA Form 154));
- l. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and completion dates.;
- m. Failure to properly pay prevailing wages as defined in Labor Code section 1720, et seq.;
- n. Failure to properly maintain or clean up the Site;

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- o. Payments to indemnify, defend, or hold harmless the District;
- p. Any payments due to the District including but not limited to payments for failed tests, or utilities changes or permits;
- q. Failure to submit an acceptable Baseline Schedule or any Schedule or Schedule update in accordance with Article 8;
- r. Failure to pay Subcontractor or suppliers as required by Article 9.8.1;
- s. Failure to secure warranties, including the cost to pay for warranties;
- t. Failure to provide releases from material suppliers or Subcontractors when requested to do so;
- u. Items deducted pursuant to Article 2.2;
- v. Incomplete Punch List items under Article 9.9.1.2 which have gone through the Article 2.2 process; or
- w. Allowances that have not been used.

9.6.2 Reallocation of Withheld Amounts

District may, in its discretion, apply any withheld amount to payment of outstanding claims or obligations as defined in Article 9.6.1 and 9.5. In so doing, District shall make such payments on behalf of Contractor. If any payment is so made by District, then such amount shall be considered as a payment made under Contract by District to Contractor and District shall not be liable to Contractor for such payments made in good faith. Such payments may be made without prior judicial determination of claim or obligation. District will render Contractor an accounting of such funds disbursed on behalf of Contractor.

If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision thereof, District may, after ten (10) calendar days written notice to the Contractor and without prejudice to any other remedy make good such deficiencies. The District shall adjust the total Contract price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work which is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract Price (of at least 150% of the estimated reasonable value of the nonconforming Work) shall be made therefor.

9.6.3 Payment After Cure

When the grounds for declining approval are removed, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

9.7 NONCONFORMING WORK

Contractor shall promptly remove from premises all Work identified by District as failing to conform to the Contract whether incorporated or not. Contractor shall promptly replace and re-execute its

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own Work to comply with the Contract without additional expense to District and shall bear the expense of making good all Work of other contractors destroyed or damaged by such removal or replacement.

If Contractor does not remove such Work which has been identified by District as failing to conform to the Contract Documents within a reasonable time, fixed by written notice, District may remove it and may store the material at Contractor's expense. If Contractor does not pay expenses of such removal within ten (10) calendar days' time thereafter, District may, upon ten (10) calendar days' written notice, sell such materials at auction or at private sale and shall account for net proceeds thereof, after deducting all costs and expenses that should have been borne by Contractor.

9.8 SUBCONTRACTOR PAYMENTS

9.8.1 Payments to Subcontractors

No later than ten (10) days after receipt, or pursuant to Business and Professions Code section 7108.5, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

9.8.2 No Obligation of District for Subcontractor Payment

The District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

9.8.3 Payment Not Constituting Approval or Acceptance

An approved Request for Payment, a progress payment, a Certificate of Substantial Completion, or partial or entire use or occupancy of the Project by the District shall not constitute acceptance of Work that is not in accordance with the Contract Documents.

9.8.4 Joint Checks

District shall have the right, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, any obligation from the District to such Subcontractor, or rights in such Subcontractor against the District. The District may choose to issue joint checks at District's sole discretion and only after all the requirements of that particular school district and county are specifically met. Some school districts cannot issue joint checks, so the ability to issue joint checks depends on the school district and the specific circumstances.

9.9 COMPLETION OF THE WORK

9.9.1 Close-Out Procedures

9.9.1.1 *Incomplete Punch Items.* When the Contractor considers the Work Substantially Complete (See Article 1.1.46 for definition of Substantially Complete), the Contractor shall prepare and submit to the District a comprehensive list of minor items to be completed or corrected

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(hereinafter “Incomplete Punch Items” or “Punch List”). The Contractor and/or its Subcontractors shall proceed promptly to complete and correct the Incomplete Punch Items listed. 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. Contractor is aware that Title 24 Section 4-343(a) provides:

“RESPONSIBILITIES. IT IS THE DUTY OF THE CONTRACTOR TO COMPLETE THE WORK COVERED BY HIS OR HER CONTRACT IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS THEREFOR. THE CONTRACTOR IN NO WAY IS RELIEVED OF ANY RESPONSIBILITY BY THE ACTIVITIES OF THE ARCHITECT, ENGINEER, INSPECTOR OR DSA IN THE PERFORMANCE OF SUCH DUTIES.

9.9.1.2 *Punch List Is Prepared Only After the Project Is Substantially Complete.* If any of the conditions noted in Article 1.1.46 as defining Substantial Completion are not met, the Inspector, Architect or District may reject Contractor’s Incomplete Punch Items as premature. If the Architect and Inspector commence review of Incomplete Punch Items, all rights are reserved until the Project actually meets the definition of Substantially Complete. Liquidated Damages, warranties, and other contractual rights are not affected by Incomplete Punch Items unless otherwise addressed in these General Conditions.

Once the Inspector and the Architect determine the Project is Substantially Complete, a Certificate of Substantial Completion shall be issued. The Inspector and Architect shall prepare a Punch List of items which is an inspection report of the Work, if any, required in order to complete the Contract Documents and ensure compliance with the DSA Approved Plans so the Project may be Completed by the Contractor and a final DSA Close-Out is approved. When all Work for the Project is Complete, including Punch Lists and all Work complies with the approved Contract Documents and Change Orders, the Project has reached Final Completion.

9.9.1.3 *Time for Completion of Punch List.* Contractor shall only be given a period of no more than thirty (30) days to complete the Punch List for the Project. During the Punch List period, the Contractor’s Superintendent and Project Manager shall remain engaged in the Project and shall not be removed or replaced. If the Punch List is not completed at the end of the Punch List time then Contractor shall issue a valued Punch List within 5 days after the date the Punch List time ends. If Contractor does not issue such a list, the District or Architect may issue a valued Punch List to the Contractor and withhold up to 150% of the value of the Punch List Work pursuant to Article 2.2 of this Agreement.

Failure to issue a timely written request for additional time to complete Punch List shall result in the deletion of the remaining Punch List Work pursuant to Article 2.2 and the issuance of a Deductive Change Order.

- a. Extension of Time to Complete Punch List. If Contractor cannot finish the Punch List Work during the time period allotted under Article 9.9.1.3, the Contractor may make a written request for a Non-Compensable Punch List time extension accompanied by an estimate of the number of additional days it will take to complete the Punch List Work for a written consent from the District to allow continued Punch List Work. Punch List time extensions are a maximum of thirty (30) days for each request and must be accompanied by an itemized valued Punch List.
- b. If there is no valued Punch List accompanying any request or if Contractor intends to undertake Punch List without the continued support and

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supervision of its Superintendent and Project Manager (as required under Article 3.2), the District, Construction Manager or Architect may issue a valued Punch List, reject the Punch List Time Extension and deduct 150% of the valued Punch List pursuant to Article 2.2 and proceed to Close-Out the Project. Contractor shall cease work on the Project and proceed to complete Contractor's Retention Payment Application and complete the Work for the Project required pursuant to Article 9.11.3

9.9.1.4 *District Rejection of Written Request for Punch List Time Extensions.* Following sixty (60) Days of Punch List under Article 9.9.1.3, the District has the option of rejecting Punch List Time Extension requests. The District may proceed under Article 2.2 and deduct the value of remaining Punch List Work pursuant to Article 2.2. If the District rejects the Punch List Time Extension request then Contractor shall cease Work on the Project and proceed to Final Inspection pursuant to Article 9.11.2.

9.9.1.5 *Punch List Liquidated Damages to Compensate for Added District Project Costs.* If the total time utilized for Punch List exceeds sixty (60) days [the thirty (30) day period under Article 9.9.1.3 plus an additional thirty (30) day period that has been requested in writing], and the District grants an additional written Punch List Time Extension that exceeds sixty (60) days of Punch List, then Contractor shall be charged Liquidated Damages of at least \$750 per day for continued Punch List Work to partially compensate the Inspector, Architect, and Construction Manager's extended time on the Project. This Punch List Liquidated Damage number is based on anticipated cost for an Inspector on site and additional costs for the Architect and Construction Manager to reinspect Punch List items and perform the administration of the Close-out.

Contractor received thirty (30) days without any charges for Punch List Liquidated Damages and is placed on notice pursuant to this Article 9.9.1.5 that \$750 is due for each day of Punch List that exceeds sixty (60) days at \$750, a cost much lower than typical (and actual) costs for Inspection, Architect and Construction Manager time required during Punch List. Starting at ninety (90) days of Punch List (an excessive number of days to complete Punch List), the District shall be entitled to adjust Punch List Liquidated Damages to an estimate of the actual costs incurred to oversee, monitor and inspect the Punch List. If costs exceed \$750 per day, the anticipated extended contract charges for Inspection, Architect, Construction Manager, and any other costs that will be incurred due to the extended Punch List shall be itemized and a daily rate of Punch List Liquidated Damages shall be presented in writing to the Contractor within five (5) days following the receipt of a written request for Punch List Time Extension by the Contractor that extends the Punch List time beyond ninety (90) days. This written notice of actual Punch List Liquidated Damages may be provided to the Contractor at any time following the first written request for Punch List Time extension requested under Article 9.9.1.3. The adjusted actual Punch List Liquidated Damage amount shall be applicable as Punch List Liquidated Damages commencing on the ninetieth (90th) day of Punch List.

9.9.2 Close-Out Requirements for Final Completion of the Project

- a. Utility Connections. Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected
- b. As-Built Up to Date and Complete. The intent of this procedure is to obtain an exact "As-Built" record of the Work upon completion of the project. The following information shall be carefully and correctly drawn on the prints and all items shall

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be accurately located and dimensioned from finished surfaces of building walls on all As-Built Drawings

1. The exact location and elevations of all covered utilities, including valves, cleanouts, etc. must be shown on As-Built Drawings
2. Contractor is liable and responsible for inaccuracies in As-Built Drawings, even though they become evident at some future date.
3. Upon completion of the Work and as a condition precedent to approval of Retention Payment, Contractor shall obtain the Inspector's approval of the "As-Built" information. When completed, Contractor shall deliver corrected sepias and/or a Diskette with an electronic file in a format acceptable to the District.
4. District may withhold the cost to hire a draftsman and potholing and testing service to complete Record As-Built Drawings at substantial cost if the Contractor does not deliver a complete set of Record As-Built Drawings. This shall result in withholding of between \$10,000 to \$20,000 per building that does not have a corresponding Record As Built Drawing.

c. Any Work not installed as originally indicated on Drawings

d. All DSA Close-Out requirements (See DSA Certification Guide) Contractor is also specifically directed to Item 3.2 in the DSA Certification Guide and the applicable certificates for the DSA-311 form.

e. Submission of Form 6-C. Contractor shall be required to execute a Form 6-C as required under Title 24 Sections 4-343. The Contractor understands that the filing with DSA of a Form 6-C is a requirement to obtain final DSA Approval of the construction by Contractor and utilized to verify under penalty of perjury that the Work performed by Contractor complies with the DSA approved Contract Documents. The failure to file a DSA Form 6C has two consequences. First, the Construction of the Project will not comply with the design immunity provisions of Government Code section 830.6 and exposes the District and the individual Board members to personal liability for injuries that occur on the Project.

Secondly , under DSA IR A-20, since the Project cannot be Certified by DSA, no future or further Projects will be authorized so Contractor will have essentially condemned the campus from any future modernization or addition of new classrooms through their failure to file the DSA Form 6C.

1. *Execution of the DSA Form 6-C is Mandatory.* Refusal to execute the Form 6-C, which is a Final DSA Verified Report that all Work performed complies with the DSA approved Contract Documents is a violation of Education Code section 81144 and shall be referred to the Attorney General for Prosecution.
2. *Referral to the District Attorney for Extortion.* If the Contractor's refusal to execute the DSA Form 6C is to leverage a Dispute, Claim or litigation,

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then the matter shall also be referred to the District Attorney for prosecution for extortion.

3. *Contractor shall be Responsible for All Costs to Certify the Project.* The District may certify the Project complies with Approved Plans and Specifications by utilizing the procedures under the Project Certification Guide (located at the DSA website). All costs for professionals, inspection, and testing required for an alternate Project Certification shall be the Contractor's responsibility and the District reserves its right to institute legal action against the Contractor and Contractor's Surety for all costs to certify the Project and all costs to correct Non-Compliant Work that is discovered during the Alternate Certification Process.
- f. ADA Work that must be corrected to receive DSA certification. See Article 12.2.
- g. Maintenance Manuals. At least thirty (30) days prior to final inspection, three (3) copies of complete operations and maintenance manuals, repair parts lists, service instructions for all electrical and mechanical equipment, and equipment warranties shall be submitted. All installation, operating, and maintenance information and Drawings shall be bound in 8½" x 11" binders. Provide a table of contents in front and all items shall be indexed with tabs. Each manual shall also contain a list of Subcontractors, with their addresses and the names of persons to contact in cases of emergency. Identifying labels shall provide names of manufactures, their addresses, ratings, and capacities of equipment and machinery.
 1. Maintenance manuals shall also be delivered in electronic media for the Project. Any demonstration videos shall also be provided on electronic media.
- h. Inspection Requirements. Before calling for final inspection, Contractor shall determine that the following Work has been performed:
 1. The Work has been completed;
 2. All fire/ life safety items are completed and in working order;
 3. Mechanical and electrical Work complete, fixtures in place, connected and tested;
 4. Electrical circuits scheduled in panels and disconnect switches labeled;
 5. Painting and special finishes complete;
 6. Doors complete with hardware, cleaned of protective film relieved of sticking or binding and in working order;
 7. Tops and bottoms of doors sealed;
 8. Floors waxed and polished as specified;

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9. Broken glass replaced and glass cleaned;
10. Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site;
11. Work cleaned, free of stains, scratches, and other foreign matter, replacement of damaged and broken material;
12. Finished and decorative work shall have marks, dirt and superfluous labels removed;
13. Final cleanup, as in Article 3.12;
14. All Work pursuant to Article 9.11; and
15. Furnish a letter to District stating that the District's Representative or other designated person or persons have been instructed in working characteristics of mechanical and electrical equipment.

9.9.3 Costs of Multiple Inspections

More than two (2) requests of the District to make inspections required under Article 9.9.1 shall be considered an additional service of Architect, Inspector, Engineer or other consultants shall be the Contractor's responsibility pursuant to Article 4.5 and all subsequent costs will be prepared as a Deductive Change Order.

9.10 PARTIAL OCCUPANCY OR USE

9.10.1 District's Rights

The District may occupy or use any completed or partially completed portion of the Work at any stage. The District and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. If District and Contractor cannot agree as to responsibilities such disagreement shall be resolved pursuant to Article 4.6. When the Contractor considers a portion complete, the Contractor shall prepare and submit a Punch List to the District as provided under Article 9.9.1.

9.10.2 Inspection Prior to Occupancy or Use

Immediately prior to such partial occupancy or use, the District, the Contractor, and the 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.

9.10.3 No Waiver

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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9.11 COMPLETION AND FINAL PAYMENT

9.11.1 Final Payment (90% Billing if Substantially Complex Finding and 95% Billing If No Finding Is Made)

The following items must be completed before the Final Payment Application will be accepted for processing at Substantial Completion of the Project:

- a. Inspector sign-off of each item in the DSA 152 Project Inspection Card;
- b. The Project has reached the Punch List items under Article 9.9.1.2 and the Project has been determined to be Substantially Complete under Article 1.1.28;
- c. Removal of temporary facilities and services;
- d. Testing, adjusting and balance records are complete;
- e. Removal of surplus materials, rubbish, and similar elements;
- f. Changeover of door locks;
- g. Deductive items pursuant to Article 9.6 and Article 2.2; and
- h. Completion and submission of all final Change Orders for the Project.

9.11.2 Final Inspection (Punch List Completion)

Contractor shall comply with Punch List procedures under Article 9.9.1.1, and maintain the presence of Project Superintendent and Project Manager (not replacement project superintendent or project manager) until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List.

Upon completion of the Work under Article 9.9.1, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect and the District finds the Work contained in the Punch List acceptable under the Contract Documents, the Work shall have reached Final Completion. Architect shall notify Contractor, who shall then submit to the Architect its Application for Retention Payment. This Application for Retention Payment shall contain any deductions under Article 9.6, including but not limited to incomplete Punch List items under Article 9.9.1.

Upon receipt and approval of Application for Retention Payment, the Architect shall issue a Form 6 stating that to the best of its knowledge, information, and belief, and on the basis of its observations, inspections, and all other data accumulated or received by the Architect in connection with the Work, such Work has been completed in accordance with the Contract Documents. The District shall thereupon inspect such Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work is not complete. Upon acceptance of the Work of the Contractor as fully complete (which, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of payment from the District, pay the amounts due Subcontractors.

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If the Architect and the District find that the Work contained in the Punch List is unacceptable, then Contractor shall issue a valued Punch List within 5 days after the date the Punch List time ends. If Contractor does not issue such a list, the District or Architect may issue a valued Punch List to the Contractor and withhold up to 150% of the value of the Punch List Work pursuant to Article 2.2 of this Agreement.

9.11.3 Retainage (100% Billing for the Entire Project)

The retainage, less any amounts disputed by the District or which the District has the right to withhold pursuant to the Contract Documents (including but not limited to incomplete Punch List items under Article 9.9.1), shall be paid after approval by the District of the Application for Retention Payment, after the satisfaction of the conditions set forth in Article 9, the Final Inspection under Article 9.11.2 is completed, and after thirty-five (35) days after the acceptance of the Work and recording of the Notice of Completion by District. No interest shall be paid on any retainage, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any escrow agreement between the District and the Contractor.

- a. Procedures for Application for Retention Payment. The following conditions must be fulfilled prior to release of Retention Payment:
 1. A full and final waiver or release of all stop notices in connection with the Work shall be submitted by Contractor, including a release of stop notice in recordable form, together with (to the extent permitted by law) a copy of the full and final release of all Stop Notice rights.
 2. The Contractor shall have made all corrections, including all Punch List Items, to the Work which are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of District required under the Contract Documents.
 3. Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, releases from the Surety and warranty bonds (if applicable) required by the Contract Documents for its portion of the Work.
 4. Contractor must have completed all requirements set forth in Article 9.9
 5. Contractor must have issued a Form 6C for the Project.
 6. The Contractor shall have delivered to the District all manuals and materials required by the Contract Documents.
 7. The Contractor shall have completed final clean up as required by Article 3.12

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8. Contractor shall have all deductive items under Article 9.6 and Article 2.2 submitted as part of the Retention Payment.

9.11.4 Recording of a Notice of Completion After Punch List Period and Final Inspection.

When the Work, or designated portion thereof, is complete or the District has completed the Article 9.6 and/or the Article 2.2 process, whichever occurs first, the District will file either a Notice of Completion or a Notice of Completion noting valued Punch List items. Valued Punch List items will be deducted from the Retention Payment.

During the time when Work is being performed on the Punch List, the Project does not meet the definition of "Complete" under Public Contract Code section 7107(c)(1) even if there is "beneficial occupancy" of the Project since that has been no "cessation of labor" on the Project. Completion of Punch List under this Article is not "testing, startup, or commissioning by the public entity or its agent." In other words, the continuing Punch List Work is Contractor labor on the Project until each and every item of Punch List Work is complete or the time periods under Article 9.9.1 have expired.

9.11.5 Warranties

Warranties required by the Contract Documents shall commence on the date of Completion of the entire Work. Warranty periods DO NOT commence at Substantial Completion or when a particular Subcontractor work is complete. No additional charges, extras, Change Orders, or Claims may be sought for warranties commencing from the Notice of Completion.

District shall have the right to utilize equipment, test, and operate as necessary for acclimation, or testing without voiding or starting warranties. Taking beneficial occupancy shall not start warranties except in the case where the District agrees, in writing, that warranties shall commence running or where the District is taking phased occupancy of specific buildings or areas and completes separate Punch Lists as further addressed in Article 4.2.7.

9.11.6 Time for Submission of Application for Final Payment and Retention Payment (Unilateral Processing of Final and Retention Payment Application).

If Contractor submits a Final Payment Application which fails to include deductive items under Article 9.6, the District or Architect shall note this defective request for Final Payment Application. The Contractor shall be notified that specific deductive items shall be included in the Final Payment Application. If Contractor either continues to submit the Final Payment Application without deductive items under Article 9.6, or a period of 14 calendar days passes after Contractor is provided written notice of deductive items for inclusion in Final Payment Application, then District may either alter the Final Payment Application and recalculate the math on the Final Payment Application to address the Article 9.6 deductive items or process a unilateral Final Payment Application.

9.11.7 Unilateral Release of Retention

After the recordation of the Notice of Completion, or within sixty (60) days following the completion of the Punch List or the expiration of the time for completion of Punch List under Article 9.9.1, if Contractor does not make an Application for Release of Retention, the District may unilaterally release retention less any deducts under Article 9.6 and/or Article 2.2, withholds due to stop notices, or withholdings due to other defective Work on the Project. District may also choose to unilaterally release Retention after deduction of 150% of any disputed items, which may also include items under Article 9.6

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and 2.2. If a deduction pursuant to Article 9.6 is made from Retention, a letter deducting specific valued items shall be considered a notice of Default under the terms of the Escrow Agreement.

9.12 SUBSTITUTION OF SECURITIES

The District will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300 as set forth in the form contained in the Bid Documents.

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ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 Contractor Responsibility

The Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Contract and shall take all necessary measures and be responsible for the proper care and protection of all materials delivered and Work performed until completion and final acceptance by the District. All Work shall be solely at the Contractor's risk, with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code section 7105(b)(2).

Contractor shall take, and require Subcontractor to take, all necessary precautions for safety of workers on the Work and shall comply with all applicable federal, state, local and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. In addition to meeting all requirements of OSHA, Cal-OSHA, state, and local codes, Contractor shall furnish, erect and properly maintain at all times, as directed by District or Architect or required by conditions and progress of Work, all necessary safety devices, safeguards, construction canopies, signs, audible devices for protection of the blind, safety rails, belts and nets, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created by such features in the course of construction. Contractor shall designate a responsible member of its organization on the Work, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety and health of workers. The name and position of person so designated shall be reported to District by Contractor. Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, such violation shall be corrected promptly.

10.1.2 Subcontractor Responsibility

Contractor shall require that Subcontractors participate in, and enforce, the safety and loss prevention programs established by the Contractor for the Project, which will cover all Work performed by the Contractor and its Subcontractors. Each Subcontractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs.

10.1.3 Cooperation

All Subcontractors and material or equipment suppliers shall cooperate fully with Contractor, the District, and all insurance carriers and loss prevention engineers.

10.1.4 Accident Reports

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Subcontractors shall immediately, within two (2) days, report in writing to the Contractor all accidents whatsoever arising out of, or in connection with, the performance of the Work, whether on or off the Site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported within four (4) days by telephone or messenger. Contractor shall thereafter immediately, within two (2) days, report the facts in writing to the District and the Architect giving full details of the accident.

10.1.5 First-Aid Supplies at Site

The Contractor will provide and maintain at the Site first-aid supplies which complies with the current Occupational Safety and Health Regulations.

10.1.6 Material Safety Data Sheets and Compliance with Proposition 65

Contractor is required to have material safety data sheets available in a readily accessible place at the job site for any material requiring a material safety data sheet per the Federal "hazard communication" standard, or employees' "right-to-know law." The Contractor is also required to properly label any substance brought into the job site, and require that any person working with the material, or within the general area of the material, is informed of the hazards of the substance and follows proper handling and protection procedures.

Contractor is required to comply with the provisions of California Health and Safety Code section 25249, et seq., which requires the posting and giving of notice to persons who may be exposed to any chemical known to the State of California to cause cancer. The Contractor agrees to familiarize itself with the provisions of this Section, and to comply fully with its requirements.

10.1.7 Non-Utilization of Asbestos Material

NO ASBESTOS OR ASBESTOS-CONTAINING PRODUCTS SHALL BE USED IN THIS CONSTRUCTION OR IN ANY TOOLS, DEVICES, CLOTHING, OR EQUIPMENT USED TO EFFECT THIS CONSTRUCTION.

Asbestos and/or asbestos-containing products shall be defined as all items containing, but not limited to, chrysotile, amosite, anthophyllite, tremolite, and antinolite.

Any or all material containing greater than one-tenth of one percent (>.1%) asbestos shall be defined as asbestos-containing material.

All Work or materials found to contain asbestos or Work or material installed with asbestos-containing equipment will be immediately rejected and this Work will be removed at no additional cost to the District.

Decontamination and removal of Work found to contain asbestos or Work installed with asbestos-containing equipment shall be done only under supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency.

The asbestos removal contractor shall be an EPA accredited contractor qualified in the removal of asbestos and shall be chosen and approved by the asbestos consultant, who shall have sole discretion and final determination in this matter.

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The asbestos consultant shall be chosen and approved by the District, who shall have sole discretion and final determination in this matter.

The Work will not be accepted until asbestos contamination is reduced to levels deemed acceptable by the asbestos consultant.

Interface of Work under this Contract with Work containing asbestos shall be executed by the Contractor at his risk and at his discretion, with full knowledge of the currently accepted standards, hazards, risks, and liabilities associated with asbestos work and asbestos-containing products. By execution of this Contract, the Contractor acknowledges the above and agrees to hold harmless District and its assigns for all asbestos liability which may be associated with this work and agrees to instruct his employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor

The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

- a. Employees on the Work and other persons who may be affected thereby;
- b. The Work, material, and equipment to be incorporated therein, whether in storage on or off the Site, under the care, custody, or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- c. Other property at the Site or adjacent thereto such as trees, shrubs, lawns, walks, pavement, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

Contractor is constructive owner of Project site as more fully discussed in Article 6.2.

10.2.2 Contractor Notices

The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss.

10.2.3 Safety Barriers and Safeguards

The Contractor shall 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 owners and users of adjacent sites and utilities.

10.2.4 Use or Storage of Hazardous Material

When use or storage of explosives, 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. The Contractor shall notify the District

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any time that explosives or hazardous materials are expected to be stored on Site. Location of storage shall be coordinated with the District and local fire authorities.

10.2.5 Protection of Work

The Contractor and Subcontractors shall continuously protect the Work, the District's property, and the property of others, from damage, injury, or loss arising in connection with operations under the Contract Documents. The Contractor and Subcontractors, at their own expense, shall make good any such damage, injury, or loss, except such as may be solely due to, or caused by, agents or employees of the District.

The Contractor, at Contractor's expense, will remove all mud, water, or other elements as may be required for the proper protection and prosecution of its Work.

Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations. All permits, licenses, or inspection fees required for such repair Work shall be obtained and paid for by Contractor.

10.2.6 Requirements for Existing Sites

Contractor shall (unless waived by the District in writing):

- a. When performing construction on existing sites, become informed and take into specific account the maturity of the students on the Site; and perform Work which may interfere with school routine before or after school hours, enclose working area with a substantial barricade, and arrange Work to cause a minimum amount of inconvenience and danger to students and faculty in their regular school activities. The Contractor shall comply with Specifications and directives of the District regarding the timing of certain construction activities in order to avoid unnecessary interference with school functioning.
- b. Avoid performing any Work that will disturb students during testing.
- c. Provide substantial barricades around any shrubs or trees indicated to be preserved.
- d. Deliver materials to building area over route designated by Architect.
- e. Take preventive measures to eliminate objectionable dust, noise, or other disturbances.
- f. Confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits or directions of Architect; and not interfere with the Work or unreasonably encumber premises or overload any structure with materials; and enforce all instructions of District and Architect regarding signs, advertising, fires, and smoking and require that all workers comply with all regulations while on the Project site.

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- g. Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved land surveyor or civil engineer and all maps and records required therefrom shall be filed with county and local authorities, at no cost to the District. All filing and plan check fees shall be paid by Contractor.
- h. Provide District on request with Contractor's written safety program and safety plan for each site.

10.2.7 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 with 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 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 District.

10.2.8 Conformance within Established Limits

The Contractor and Subcontractors shall confine their construction equipment, the storage of materials, and the operations of workers to the limits indicated by laws, ordinances, permits, and the limits established by the District or the Contractor, and shall not unreasonably encumber the premises with construction equipment or materials.

10.2.9 Subcontractor Enforcement of Rules

Subcontractors shall enforce the District's and the Contractor's instructions, laws, and regulations regarding signs, advertisements, fires, smoking, the presence of liquor, and the presence of firearms by any person at the Site.

10.2.10 Site Access

The Contractor and the Subcontractors shall use only those ingress and egress routes designated by the District, observe the boundaries of the Site designated by the District, park only in those areas designated by the District, which areas may be on or off the Site, and comply with any parking control program established by the District, such as furnishing license plate information and placing identifying stickers on vehicles.

10.2.11 Security Services.

The Contractor shall be responsible for providing security services for the Site as needed for the protection of the Site and as determined in the District's sole discretion.

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10.3 EMERGENCIES

10.3.1 Emergency Action

In an emergency affecting the safety of persons or property, the Contractor shall take any action necessary, 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 7.

10.3.2 Accident Reports

The Contractor shall promptly report in writing to the District all accidents arising out of or in connection with the Work, which caused death, personal injury, or property damage, giving full details and statements of any witnesses in conformance with Article 10.1.4. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported in accordance with Article 10.1.4, immediately by telephone or messenger to the District.

10.4 HAZARDOUS MATERIALS

10.4.1 Discovery of Hazardous Materials

In the event the Contractor encounters or suspects the presence on the job site of material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or any other material defined as being hazardous by § 25249.5 of the California Health and Safety Code, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the District and the Architect in writing, whether or not such material was generated by the Contractor or the District. The Work in the affected area shall not thereafter be resumed, except by written agreement of the District and the Contractor, if in fact the material is asbestos, polychlorinated biphenyl (PCB), or other hazardous material, and has not been rendered harmless. The Work in the affected area shall be resumed only in the absence of asbestos, polychlorinated biphenyl (PCB), or other hazardous material, or when it has been rendered harmless by written agreement of the District and the Contractor.

10.4.2 Hazardous Material Work Limitations

In the event that the presence of hazardous materials is suspected or discovered on the Site (except in cases where asbestos and other hazardous material Work in the Contractor's responsibility), the District shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required. The Contractor shall not be required pursuant to Article 7 to perform without consent any Work in the affected area of the Site relating to asbestos, polychlorinated biphenyl (PCB), or other hazardous material, until any known or suspected hazardous material has been removed, or rendered harmless, or determined to be harmless by District, as certified by an independent testing laboratory and approved by the appropriate government agency.

10.4.3 Indemnification by Contractor for Hazardous Material Caused by Contractor

In the event the hazardous materials on the Project Site is caused by the Contractor, the Contractor shall pay for all costs of testing and remediation, if any, and shall compensate the District for any additional costs incurred as a result of Contractor's generation of hazardous material on the Project Site. In addition, the Contractor shall defend, indemnify and hold harmless District and its agents, officers,

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and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, arising out of, or relating to, the presence of hazardous material on the Project Site.

10.4.4 Terms of Hazardous Material Provision

The terms of this Hazardous Material provision shall survive the completion of the Work and/or any termination of this Contract.

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ARTICLE 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 Insurance Requirements

Before the commencement of the Work, the Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in California with a financial rating of at least an A-VIII status as rated in the most recent edition of Best's Insurance Reports or as amended by the Supplementary General Conditions, such insurance as will protect the District from claims set forth below, which may arise out of or result from the Contractor's Work under the Contract and for which the Contractor may be legally liable, whether such Work are by the Contractor, by a Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Any required insurance shall not contain any exclusion that applies to the type of work performed by the Contractor under the Contract Documents.

- a. Claims for damages because of bodily injury, sickness, disease, or death of any person District would require indemnification and coverage for employee claim;
- b. Claims for damages insured by usual personal injury liability coverage, which are sustained by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor or by another person;
- c. Claims for damages because of injury or destruction of tangible property, including loss of use resulting therefrom, arising from operations under the Contract Documents;
- d. 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;
- e. Claims involving 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
- f. Claims involving Completed Operations, Independent Contractors' coverage, and Broad Form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, and excavating. (XCU)
- g. Claims involving sudden or accidental discharge of contaminants or pollutants.

11.1.2 Specific Insurance Requirements

Contractor shall take out and maintain and shall require all Subcontractors, if any, whether primary or secondary, to take out and maintain:

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Comprehensive General Liability Insurance with a combined single limit per occurrence of not less than \$2,000,000.00 or Commercial General Liability Insurance which provides limits of not less than:

- (a) Per occurrence (combined single limit) \$2,000,000.00
.....
- (b) Project Specific Aggregate (for this Project only) \$2,000,000.00
.....
- (c) Products and Completed Operations (aggregate) \$2,000,000.00
.....
- (d) Personal and Advertising Injury Limit \$1,000,000.00
.....

Insurance Covering Special Hazards

The following Special hazards shall be covered by riders or riders to above mentioned public liability insurance or property damage insurance policy or policies of insurance, in amounts as follows:

- (a) Automotive and truck where operated in \$1,000,000.00 amounts
.....
- (b) Material Hoist where used in \$1,000,000.00 amounts
.....
- (c) Explosion, Collapse and Underground (XCU coverage) \$1,000,000.00
.....
- (d) Hazardous Materials \$1,000,000.00
.....

In addition, provide Excess Liability Insurance coverage in the amount of Four Million Dollars (\$4,000,000.00).

11.1.3 Subcontractor Insurance Requirements

The Contractor shall require its Subcontractors to take out and maintain public liability insurance and property damage insurance required under Article 11.1 in like amounts. A “claims made” or

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modified “occurrence” policy shall not satisfy the requirements of Article 11.1 without prior written approval of the District.

11.1.4 Additional Insured Endorsement Requirements

The Contractor shall name, on any policy of insurance required under Article 11.1, the District, CM, Architect, Inspector, the State of California, their officers, employees, agents, volunteers and independent contractors as additional insureds. Subcontractors shall name the Contractor, the District, Architect, Inspector, the State of California, their officers, employees, agents, volunteers and independent contractors as additional insureds. The Additional Insured Endorsement included on all such insurance policies shall be an ISO CG 20 10 (04/13), or an ISO CG 20 38 (04/13), or their equivalent as determined by the District in its sole discretion, and must 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, such other insurance shall be on an excess or contingent basis. The insurance provided by the Contractor pursuant to 11.1 must be designated in the policy as primary to any insurance obtained by the District. The amount of the insurer’s liability shall not be reduced by the existence of such other insurance.

11.2 WORKERS’ COMPENSATION INSURANCE

During the term of this Contract, the Contractor shall provide workers’ compensation and employer’s liability 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 subcontracted, 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 insurance coverage for the protection of those employees not otherwise protected. The Contractor shall file with the District certificates of insurance as required under Article 11.6 and in compliance with Labor Code § 3700.

Workers’ compensation limits as required by the Labor Code, but not less than \$1,000,000 and employers’ liability limits of \$1,000,000 per accident for bodily injury or disease.

11.3 BUILDER’S RISK/ “ALL RISK” INSURANCE

11.3.1 Course-of-Construction Insurance Requirements

The Contractor, during the progress of the Work and until final acceptance of the Work by District upon completion of the entire Contract, shall maintain Builder’s Risk, Course of Construction or similar first party property coverage issued on a replacement cost value basis consistent with the total replacement cost of all insurable Work and the Project included within the Contract Documents. Coverage is to insure against all risks of accidental direct physical loss, and must include, by the basic grant of coverage or by endorsement, the perils of vandalism, malicious mischief (both without any limitation regarding vacancy or occupancy), fire, sprinkler leakage, civil authority, sonic boom, earthquake, flood, collapse, wind, lightning, smoke and riot. The coverage must include debris removal, demolition, increased costs due to enforcement of building ordinance and law in the repair and replacement of damage and undamaged portions of the property, and reasonable costs for the Architect’s and engineering services and expenses required as a result of any insured loss upon the Work and Project which is the subject of the Contract Documents, including completed Work and Work in progress, to the full insurable value thereof.

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Such insurance shall include the District and the Architect as additional named insureds, and any other person with an insurable interest as designated by the District.

The Contractor shall submit to the District for its approval all items deemed to be uninsurable. The risk of the damage to the Work due to the perils covered by the “Builder’s Risk/All Risk” 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 District nor will such loss or damage excuse the complete and satisfactory performance of the Contract by the Contractor.

11.4 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 subject to loss or damage by fire. The amount of fire insurance shall be sufficient to protect the Project against loss or damage in full until the Work is accepted by the District. This requirement may be waived upon confirmation by the District that such coverage is provided under the Builder’s Risk Insurance being provided.

11.5 AUTOMOBILE LIABILITY

11.5.1 The District, Architect and Construction Manager, Inspectors, their directors, officers, employees, agents and volunteers shall be covered as additional insureds with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by the Contractor or for which the Contractor is responsible. Such insurance coverage shall be primary and non-contributory insurance as respects the District, Architect, Construction Manager, Project Inspector, their directors, officers, employees, agents and volunteers, or if excess, shall stand in an unbroken chain of coverage excess of the Contractor’s scheduled underlying coverage. Any insurance or self-insurance maintained by the District, Architect, Construction Manager, Project Inspector, their directors, officers, employees, agents and volunteers shall be excess of the Contractor’s insurance and shall not be called upon to contribute with it. The insurer shall agree to waive all rights of subrogation against the District, Architect, Construction Manager, Project Inspector, their directors, officers, employees, agents and volunteers for losses paid under the terms of the insurance policy that arise from Work performed by the Contractor.

11.5.2 Insurance Services Office Business Auto Coverage Form Number CA 0001, Code 1 (any auto) is required. Comprehensive Automobile Liability insurance to include all autos, owned, non-owned, and hired, with limits of \$1,000,000 per accident for bodily injury and property damage.

11.6 OTHER INSURANCE

The Contractor shall provide all other insurance required to be maintained under applicable laws, ordinances, rules, and regulations.

11.7 PROOF OF INSURANCE

The Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract until all required insurance and certificates have been obtained and delivered in duplicate to the District for approval subject to the following requirements:

- a. Certificates and insurance policies shall include the following clause:

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“This policy and any coverage shall not be suspended, voided, non-renewed, canceled, or reduced in required limits of liability or amounts of insurance or coverage until notice has been mailed via certified mail to the District. Date of cancellation or reduction may not be less than thirty (30) days after the date of mailing notice.”

- b. 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.
- c. Certificates of insurance shall clearly state that the District 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 District.
- d. The Contractor and its Subcontractors shall produce a certified copy of any insurance policy required under this Section upon written request of the District.

11.8 COMPLIANCE

In the event of the failure of Contractor to furnish and maintain any insurance required by this Article 11, the Contractor shall be in default under the Contract. Compliance by Contractor with the requirement to carry insurance and furnish certificates or policies 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 District and the Architect.

11.9 WAIVER OF SUBROGATION

Contractor waives (to the extent permitted by law) any right to recover against the District for damages to the Work, any part thereof, or any and all claims arising by reason of any of the foregoing, but only to the extent that such damages and/or claims are covered by property insurance and only to the extent of such coverage (which shall exclude deductible amounts) by insurance actually carried by the District.

The provisions of this Article are intended to restrict each party to recovery against insurance carriers only to the extent of such coverage and waive fully and for the benefit of each, any rights and/or claims which might give rise to a right of subrogation in any insurance carrier. The District and the Contractor shall each obtain in all policies of insurance carried by either of them, a waiver by the insurance companies thereunder of all rights of recovery by way of subrogation for any damages or claims covered by the insurance.

11.10 PERFORMANCE AND PAYMENT BONDS

11.10.1 Bond Requirements

Unless otherwise specified in the Supplemental Conditions, prior to commencing any portion of the Work, the Contractor shall furnish 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 as sureties.

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To the extent, if any, that the Contract Price is increased in accordance with the Contract Documents, the Contractor shall, upon request of the District, cause the amount of the bonds to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the District. 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 Contract Price, 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 bonds, the District may terminate the Contract for cause.

11.10.2 Surety Qualification

Only bonds executed by admitted Surety insurers as defined in Code of Civil Procedure § 995.120 shall be accepted. Surety must be a California-admitted Surety and listed by the U.S. Treasury with a bonding capacity in excess of the Project cost.

11.10.3 Alternate Surety Qualifications

If a California-admitted Surety insurer issuing bonds does not meet these requirements, the insurer will be considered qualified if it is in conformance with § 995.660 of the California Code of Civil Procedure and proof of such is provided to the District.

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ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

12.1 COMPLIANCE WITH TITLE 24 INSTALLATION REQUIREMENTS

Contractor is aware of the requirements governing Contractor's Work under title 24 Section 4-343 which provides, in pertinent part:

4-343. Duties of the Contractor.

(a) **Responsibilities.** It is the duty of the contractor to complete the Work covered by his or her contract in accordance with the approved Plans and Specifications therefore. The contractor in no way is relieved of any responsibility by the activities of the architect, engineer, Inspector or DSA in the performance of such duties.

(b) **Performance of the Work.** The contractor shall carefully study the approved Plans and Specifications and shall plan a schedule of operations well ahead of time. If at any time it is discovered that Work is being done which is not in accordance with the approved Plans and Specifications, the contractor shall correct the Work immediately. All inconsistencies or items which appear to be in error in the Plans and Specifications shall be promptly called to the attention of the architect or registered engineer, through the Inspector, for interpretation or correction. In no case, however, shall the instruction of the architect or registered engineer be construed to cause Work to be done which is not in conformity with the approved Plans, Specifications, and Change Orders. The contractor must notify the Project Inspector, in advance, of the commencement of construction of each and every aspect of the Work.

12.1.1 Issuance of Notices of Non-Compliance

The Inspector may issue a Notice of Non-Compliance on the Project indicating deviation from Plans and Specifications. It is Contractor's responsibility to correct all deviations from the approved Plans and Specifications unless the District has issued an Immediate Change Directive. In such case, the Contractor shall proceed with the Work with the understandings of the District as set forth in the ICD and as specifically noted in Article 7.3.

12.2 SPECIAL NOTICE OF AMERICAN'S WITH DISABILITIES ACT

Some of the requirements in the Plans and Specifications are meant to comply with the Americans with Disabilities Act ("ADA"). The requirements of the ADA are technical in nature and may appear to be minor in nature (i.e. whether a walkway or ramp has a 2% cross-slope). Contractor is warned that even the slightest deviation from the specific requirements from the ADA is considered a Civil Rights violation and subjects the District to fines of three times actual damages sustained by a handicap individual or up to \$4,000 per violation and attorney's fees required to enforce the ADA violation. As a result of the significant liability and exposure associated with ADA aspects of the Contract, Contractor shall take special care to meet all ADA requirements detailed in the Plans and Specifications. Failure to comply with ADA rules that results in a Notice of Non-Compliance shall be repaired to meet ADA requirements promptly. In addition, any ADA violations that are not identified by Inspector or Architect that are later identified shall be repaired and charged back to the Contractor through a Deductive Change Order.

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12.2.1 Indemnification of ADA Claims

Contractor shall indemnify, hold harmless and defend the District from ADA claims arising from the failure to comply with the Plans and Specifications. Further, any withholdings for ADA violations under Article 9.6 shall include potential redesign costs and an accelerated repair costs due to the potential for ADA claims arising from DSA posting of ADA violations on the Project.

12.3 UNCOVERING OF WORK

12.3.1 Uncovering Work for Required Inspections

Work shall not be covered without the Inspector's review and the Architect's knowledge that the Work conforms with the requirements of the approved Plans and Specifications (except in the case of an ICD under Article 7.3). Inspector must be timely notified of inspections and of new areas so Work can be inspected at least 48 hours before opening a new area (For example, see DSA Form 156 for Commencement/Completion of Work Notification which requires "at least 48 hour" advance notification of a new area). An Inspector must comply with DSA protocols for signing each category or phase of Work under DSA Form 152 (in compliance with the Form 152 Manual) or a Notice of Deviation (DSA Form 154) will be issued requiring the Work that was not inspected be uncovered for inspection. Thus, if a portion of the Work is covered without inspection or Architect approval, is subject to a Notice of Non-Compliance for being undertaken without inspection, or otherwise not in compliance with the Contract Documents, after issuance of a Written Notice of Non-Compliance (Form 154) or a written notice to uncover Work, Contractor shall promptly uncover all Work (which includes furnishing all necessary facilities, labor, and material) for the Inspector's or the Architect's observation and such Work shall be replaced at the Contractor's expense without change in the Contract Sum or Time.

12.3.2 Costs for Inspections Not Required

If a portion of the Work has been covered is believed to be Non-Conforming to the Plans and Specifications, even if the Form 152 for the category of Work has been signed by the Inspector, the Inspector or the Architect may request to see such Work, and it shall be promptly uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncover and replacement shall, by appropriate Change Order and shall, be charged to the District. If such Work is not in accordance with Contract Documents, the Contractor shall be responsible for all costs to uncover the Work, delays incurred to uncover the Work, and Contractor shall pay all costs to correct the Non-Conforming construction condition unless the condition was caused by the District or a separate contractor, in which event the District shall be responsible for payment of such costs to the Contractor.

12.4 CORRECTION OF WORK

12.4.1 Correction of Rejected Work

The Contractor shall promptly correct the Work rejected by the Inspector or the District upon recommendation of the Architect as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not Fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including cost for delays that may be incurred by Contractor or Subcontractors, the cost for additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby (including costs for preparing a CCD, DSA CCD review fees, and additional inspection and special inspection costs).

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12.4.2 One-Year Warranty Corrections

If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established under Article 9.9.1, or by the terms of an 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 written notice from the District to do so unless the District has previously given the Contractor a written acceptance of such condition. This period of one (1) year shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation under this Article 12.4.2 shall survive acceptance of the Work under the Contract and termination of the Contract. The District shall give such notice promptly after discovery of the condition.

12.4.3 District's Rights if Contractor Fails to Correct

If the Contractor fails to correct nonconforming Work within a reasonable time, the District may correct the Work and seek a Deductive Change Order, pursuant to Article 9.6 or Article 2.2.

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ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

The District and the Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

In the absence of specific notice requirements in the Contract Documents, written notice shall be deemed to have been duly served if delivered in person to the individual, member of the firm or entity, or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.4 RIGHTS AND REMEDIES

13.4.1 Duties and Obligations Cumulative

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.

13.4.2 No Waiver

No action or failure to act by the Inspector, the District, or the Architect shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Compliance

Tests, inspections, and approvals of portions of the Work required by the Contract Documents will comply with Division 1, Title 24, and with all other laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction.

13.5.2 Independent Testing Laboratory

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The District will select and pay an independent testing laboratory to conduct all tests and inspections. Selection of the materials required to be tested shall be made by the laboratory or the District's representative and not by the Contractor. See Articles 3.13.1 and 4.3.6 regarding costs or expenses of inspection or testing outside of the Project Site.

13.5.3 Advance Notice to Inspector

The Contractor shall notify the Inspector a sufficient time in advance of its readiness for required observation or inspection so that the Inspector may arrange for same. The Contractor shall notify the 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 Documents, be tested in order that the Inspector may arrange for the testing of the material at the source of supply.

13.5.4 Testing Off-Site

Any material shipped by the Contractor from the source of supply, prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said Inspector that such testing and inspection will not be required, shall not be incorporated in the Work.

13.5.5 Additional Testing or Inspection

If the Inspector, the Architect, the District, or public authority having jurisdiction determines that portions of the Work require additional testing, inspection, or approval not included under Article 13.5.1, the Inspector will, upon written authorization from the District, make arrangements for such additional testing, inspection, or approval. The District shall bear such costs except as provided in Articles 13.5.6 and 13.5.7.

13.5.6 Costs for Retesting

If such procedures for testing, inspection, or approval under Articles 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs arising from such failure, including those of re-testing, re-inspection, or re-approval, including, but not limited to, compensation for the Architect's services and expenses. Any such costs shall be paid by the District, invoiced to the Contractor, and deducted from the next Progress Payment.

13.5.7 Costs for Premature Test

In the event the Contractor requests any test or inspection for the Project and is not completely ready for the inspection, the Contractor shall be invoiced by the District for all costs and expenses resulting from that testing or inspection, including, but not limited to, the Inspector's and Architect's fees and expenses, and the amount of the invoice shall be deducted from the next Progress Payment.

13.6 TRENCH EXCAVATION

13.6.1 Trenches Greater Than Five Feet

Pursuant to Labor Code section 6705, if the Contract Price exceeds \$25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of

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excavation, submit to the District or a registered civil or structural engineer employed by the District or Architect, 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, 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 District or by the person to whom authority to accept has been delegated by the District.

13.6.3 No Tort Liability of District

Pursuant to Labor Code § 6705, nothing in this Article shall impose tort liability upon the District 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 WAGE RATES, TRAVEL, AND SUBSISTENCE

13.7.1 Wage Rates

Pursuant to the provisions of Article 2 (commencing at § 1720), Chapter 1, Part 7, Division 2, of the Labor Code, the District 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 District 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.

13.7.2 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.

13.7.3 Wage Rates Not Affected by Subcontracts

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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.

13.7.4 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.

13.7.5 Forfeiture and Payments

Pursuant to Labor Code §1775, the Contractor shall forfeit to the District, 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.

13.7.6 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.

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.

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

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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.

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.

13.8 RECORDS OF WAGES PAID

13.8.1 Payroll Records

- a. 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.
- b. 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:
 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 shall be made available for inspection or furnished upon request to a representative of District, the Division of Labor Standards Enforcement or the Division of Apprenticeship Standards of the Department of Industrial Relations.
 3. 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 District, 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.

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- c. 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.
- d. 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.
- e. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District, 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.
- f. The Contractor shall inform the District 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.
- g. 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 District, 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.

Responsibility for compliance with this Article shall rest upon the Contractor.

13.8.2 Withholding of Contract Payments & Penalties

The District may withhold or delay contract payments to the Contractor and/or any Subcontractor if:

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- a. 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
- b. 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
- c. The Contractor or Subcontractor(s) submit incomplete or inadequate payroll records; or
- d. The Contractor or Subcontractor(s) fail to comply with the Labor Code requirements concerning apprentices; or
- e. The Contractor or Subcontractor(s) fail to comply with any applicable state laws governing workers on public works projects.

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 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.

13.9.2 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 apprenticeable 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. "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 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.

13.9.3 Submission of Contract Information

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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 Contract, 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 District if requested. Within 60 days after concluding Work on the Project, the Contractor and Subcontractors shall submit to the District, if requested, and to the apprenticeship program a verified statement of the journeyman and apprentice hours performed on the Project.

13.9.4 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 apprenticeable 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.

13.9.5 Prime Contractor Compliance

The responsibility of compliance with Article 13 and §1777.5 of the Labor Code for all apprenticeable 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.

13.10 ASSIGNMENT OF ANTITRUST CLAIMS

13.10.1 Application

Pursuant to Government Code § 4551, 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 District all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act, (15 U.S.C. § 15) or under the Cartwright Act (Chapter 2 [commencing with § 16700] of Part 2 of Division 7 of the Business and Professions 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 awarding body tenders Retention Payment to the Contractor, without further acknowledgment by the parties. If the District 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, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the District any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the District as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

13.10.2 Assignment of Claim

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Upon demand in writing by the assignor, the District 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 District has not been injured thereby or the District declines to file a court action for the cause of action.

13.11 STATE AND DISTRICT CONDUCTED AUDITS

Pursuant to and in accordance with the provisions of Government Code § 10532, or any amendments thereto, all books, records, and files of the District, 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 five (5) years after Retention Payment is made or a Notice of Completion is Recorded, whichever occurs first. Contractor shall preserve and cause to be preserved such books, records, hard drives, electronic media, and files for the audit period.

Pursuant to the remedies under Public Contract Code section 9201 and Government Code section 930.2, Contractor, through execution of this Agreement, also agrees the District shall have the right to review and audit, upon reasonable notice, the books and records of the Contractor concerning any monies associated with the Project. The purpose of this "Audit" is to quickly and efficiently resolve Disputes and Claims based on the actual costs incurred and to reduce the uncertainty in resolving Disputes and Claims with limited information. The District shall perform any audits at its own cost and any such audit shall be performed by an independent auditor, having no direct or indirect relationship with the functions or activities being audited or with the business conducted by the Contractor or District. In the event the independent auditor determines that Change Orders, response to Request for Proposals, Disputes, Claims, or other requests for payment are in error, or have has any other concerns or questions, the Auditor shall report the results of the Audit findings to the District and provide a copy to the Contractor after giving the District Board the opportunity for at least 10 days review. If the Contractor disputes the findings of the independent auditor, such dispute shall be handled in the manner set forth under Article 4.6.2.

If Contractor having agreed to the terms of this Contract fails to produce books or records requested by Auditor, such failure to produce books or records that were required to be preserved for audit, it shall be presumed that the information contained in the withheld books or records were unfavorable to the Contractor and the Auditor shall note this refusal in the results of the Audit findings for further evaluation by the District and the District's Board. The refusal to release records that are concerning monies associated with the Project may be used as a grounds to debar the Contractor under Article 15 for failure to preserve records under Article 13.11 and the failure to produce required audit records may also be used as a grounds for a negative finding against the Contractor depending on the significance of the records that are withheld by Contractor. Failure to produce job cost data tied to job cost categories and budgets shall be presumed an intentional failure to produce key audit records. Similarly, failure to produce Daily Reports (prepared at or near the time of the Work actually took place (See Article 3.16) shall be presumed an intentional failure to produce key audited records.

If Contractor is seeking costs for inefficiency, home office overhead, or unanticipated increased costs due to delays or acceleration, Contractor shall also produce copies of the original bid tabulation utilized in submitting Contractor's bid for the Project. This document shall be considered confidential and shall not be subject to disclosure through a Public Records Act and shall not be distributed to anyone other than the District and the District's counsel. This bid tabulation shall only be used in litigation, arbitration, evaluation of Claims or Disputes, Audit, and trial. If the records for the bid tabulation are kept on a computer, the Contractor shall also produce all metadata (in native format) that accompanies

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the bid tabulation for inspection to prove the authenticity of the underlying bid tabulation. Failure to produce the bid tabulation for review of inefficiency, home office overhead, or unanticipated increased costs due to delays or accelerations shall be considered material evidence that the bid tabulation was not favorable to the Contractor. This evidence shall be entered as a jury instruction for trial that the bid tabulation was not produced and the bid tabulation information was unfavorable to the Contractor. The evidence may also be used in debarment proceedings, and noted as an exception to an Audit findings.

Upon notification of Contractor concerning the results of the audit and a reasonable time has passed for Contractor to respond to the Audit findings and if either there is no Dispute of the Audit findings under Article 4.6 or if the result after utilizing the Disputes Clause confirms the Audit findings, the District may seek reimbursement for overstated Disputes, Claims, or Change Orders and may also undertake debarment proceedings under Article 15 of these General Conditions.

13.12 STORM WATER POLLUTION PREVENTION

13.12.1 Application

This Section addresses the preparation, implementation and monitoring of a Storm Water Pollution Prevention Plan (SWPPP) for the purpose of preventing the discharge of pollutants from the construction site. This includes the elimination of pollution discharges such as improper dumping, spills or leakage from storage tanks or transfer areas. The District will not issue a Notice to Proceed until Contractor has prepared by a qualified individual and obtained approval of the Permit Registration Documents (“PRDs”) that include a Notice of Intent, Construction Risk Calculation, Site Map, SWPPP, Annual Fee and any additional required documents from all applicable Local Governing Agencies including the Regional Water Quality Control Board. The Contractor shall also secure a certification that the Project has met all of the conditions of the General Construction Activity Storm Water Permit (GCASP) and comply with all applicable local, state and federal regulations governing storm water pollution prevention.

13.12.2 References and Materials

- California Stormwater Quality Association New Development and Redevelopment Best Management Practice Handbook
- 2009 California Stormwater Quality Association Construction BMP Handbook .
- State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbing Activities. Available on-line at:
- http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.- Use materials of a class, grade and type needed to meet the performance described in the BMP Handbook.

13.12.3 Preparation and Approval

The Contractor shall prepare by a qualified individual the PRDs that include a Notice of Intent, Construction Risk Calculation, Site Map, SWPPP, Annual Fee and any additional required documents. The Contractor’s Qualified SWPPP Developer (“QSD”) shall prepare the Storm Water Pollution Prevention Plan (SWPPP) as required to comply with storm water pollution regulations for project sites with storm water discharges associated with construction activity such as clearing or demolition,

GENERAL CONDITIONS

grading, excavation and other land disturbances. The SWPPP shall apply to all areas that are directly related to construction activity, including but not limited to staging areas, storage yards, material borrow areas, and access roads.

13.12.3.1 The Contractor shall prepare and submit to the Local Governing Agencies and the District the SWPPP for review and approval if the project sites, new or existing, with land disturbance of 1 or more acres (or less than 1 acres if part of a common plan of development); the construction activity that results in land surface disturbances of less than one acre is part of a larger common plan of development or sale of one or more acres of disturbed land surface; or the construction activity associated with Linear Underground/Overhead Projects ("LUPs") including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

13.12.3.2 The Contractor shall also pay annual renewal fee(s) until the contract is completed and make all such checks payable to the State Water Resources Control Board. The Notice of Intent must be submitted at least two weeks prior to the commencement of construction activities.

13.12.3.3 The Contractor shall prepare the SWPPP by following the format in Sections 2, 3, 4 and Appendices A through F of the California Stormwater BMP Handbook - Construction, January 2009 edition, published by the California Stormwater Quality Association. The publication is available from:

13.12.3.4
California Stormwater
Quality Association
P.O. Box 2105
Menlo Park, CA 94026-2105
Phone: (650) 366-1042
E-mail: info@casqa.org

or

<https://www.casqa.org/store/products/tabid/154/p-167-construction-handbookportal-initial-subscription.aspx>

13.12.3.5 Where land disturbance is less than 1 acre, any BMPs indicated in the BMP Handbook needed to prevent or minimize storm water pollution shall be implemented at no extra cost to the District.

13.12.3.6 Within two weeks after Award of Contract by the District, the Contractor shall submit to the District's Civil Engineer one copy of the PRDs including the SWPPP for review. After the District's approval, the Contractor shall provide approved copies of the SWPPP as follows: one copy each to the Project Inspector, Construction Manager, Architect, Commissioned Architect and District's Civil Engineer.

GENERAL CONDITIONS

13.12.4 Implementation

The Contractor shall implement the Storm Water Pollution Prevention Plan by doing the following:

- a. Obtain a Waste Discharger Identification (WDID) number from the SWRCB before beginning construction. This number will be issued once your PRDs are administratively accepted and fee is received.
- b. Keep the SWPPP, REAPs, monitoring data on the construction site.
- c. Employ a Qualified SWPPP Practitioner (QSP) to implement the SWPPP during construction and develop Rain Event Action Plans ("REAPs").
- d. Install, inspect, maintain and monitor BMPs required by the General Permit.
- e. Install perimeter controls prior to starting other construction work at the site.
- f. Contain on-site storm water at the jobsite. Do not drain on-site water directly into the storm drain.
- g. Implement the SWPPP.
- h. Provide SWPPP and BMP implementation training for those responsible for implementing the SWPPP.
- i. Designate trained personnel for the proper implementation of the SWPPP.
- j. Conduct monitoring, as required, and assess compliance with the Numeric Action Levels (NALs) or Numeric Effluent Limitations (NELs) appropriate to your project.
- k. Report monitoring data:
 1. Maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed.
 2. Have a QSD revise the SWPPP as needed to reflect the phases of construction and to suit changing site conditions and instances when properly installed systems are ineffective.
 3. Assist the District with entering any necessary data or information into the Stormwater Multi-Application and Reporting System ("SMARTS") system.
- l. At the end of Construction Contract:

GENERAL CONDITIONS

1. Submit Notice of Termination (NOT) into the SMARTS when construction is complete and conditions of termination listed in the NOT have been satisfied. A copy of the NOT can be found at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.
2. Leave in place storm water pollution prevention controls needed for post-construction storm water management and remove those that are not needed as determined by the District. Thereafter, left-in-place controls will be maintained by the District.
3. Provide Site Monitoring Reports, SWPPP revisions, Compliance Certifications and related documents to the District. Post-construction storm water operation and management plan as mentioned in the compliance certifications are considered to be in place at the end of the Construction Contract.

13.12.5 Monitoring

The Contractor shall conduct examination of storm water pollution prevention controls as required by the State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbing Activities. This includes properly qualified personnel performing all required monitoring, testing, inspections and monitoring. The Contractor shall also conduct examination of storm water pollution prevention controls, as well as before and after each storm event in compliance with the State Water Resources Control Board Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (General Permit) (SWRCB, 2009).and at least once each 24-hour period during extended storm events to identify BMP effectiveness and implement repairs or BMP changes as soon as feasible. All maintenance related to a storm event should be completed within 48 hours of the storm event. The Contractor shall also prepare and maintain, at the jobsite, a log of each inspection using Site Monitoring Report forms.

13.12.6 Liabilities and Penalties

- a. Review of the SWPPP and inspection logs by the District shall not relieve the Contractor from liabilities arising from non-compliance with storm water pollution regulations.
- b. Payment of penalties for non-compliance by the Contractor shall be the sole responsibility of the Contractor and will not be reimbursed by the District.
- c. Compliance with the Clean Water Act pertaining to construction activity is the sole responsibility of the Contractor. For any fine(s) levied against the District due to non-compliance by the Contractor, the District will deduct from the final payment due the Contractor the total amount of the fine(s) levied on the District, plus legal and associated costs.

GENERAL CONDITIONS

- d. The Contractor shall submit to the District a completed NOI for change of information (Construction Site Information and Material Handling/Management Practices).

GENERAL CONDITIONS

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE

14.1.1 Grounds for Termination

The Contractor may terminate the Contract if the Work is stopped for a period of thirty (30) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons performing portions of the Work for whom the Contractor is contractually responsible, for only the following reasons:

- a. Issuance of an order of a court or other public authority having jurisdiction; or
- b. An act of the United State or California government, such as a declaration of national emergency.

14.1.2 Notice of Termination

If one of the above reasons exists, the Contractor may, upon written notice of seven (7) additional days to the District, terminate the Contract and recover from the District payment for Work executed and for reasonable costs verified by the Architect with respect to materials, equipment, tools, construction equipment, and machinery, including reasonable overhead, profit, and damages.

14.2 TERMINATION BY THE DISTRICT FOR CAUSE

14.2.1 Grounds for Termination

The District may terminate the Contractor and/or this Contract for the following reasons:

- a. Persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- b. Persistently or repeatedly is absent, without excuse, from the job site;
- c. Fails to make payment to Subcontractors, suppliers, materialmen, etc.;
- d. Persistently disregards laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction;
- e. Fails to provide a schedule or fails or refuses to update schedules required under the Contract;
- f. Falls behind on the Project and refuses or fails to undertake a Recovery Schedule;
- g. If the Contractor has been debarred from performing Work
- h. Becomes bankrupt or insolvent, including the filing of a general assignment for the benefit of creditors; or

GENERAL CONDITIONS

- i. Otherwise is in substantial breach of a provision of the Contract Documents.

14.2.2 Notification of Termination

When any of the above reasons exist, the District may, without prejudice to any other rights or remedies of the District and after giving the Contractor and the Contractor's Surety written notice of seven (7) days, terminate the Contractor and/or this Contract and may, subject to any prior rights of the Surety:

- a. Take possession of the Project and of all material, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- b. Accept assignment of Subcontracts. Contractor acknowledges and agrees that if the District (in its sole and absolute discretion) decides to takeover completion of the Project, the Contractor agrees to immediately assign all subcontracts to the District which the District has chosen to accept;
- c. Complete the Work by any reasonable method the District may deem expedient, including contracting with a replacement contractor or contractors; and,
- d. Agree to accept a takeover and completion arrangement with Surety that is acceptable to the District Board.

14.2.3 Takeover and Completion of Work after Termination for Cause

A Termination for Cause is an urgent matter which requires immediate remediation since Project Work is open and incomplete, the site is subject to vandalism and theft, the Project site is considered a public nuisance, and there is a possibility of injury and deterioration of the Project Work and materials. Thus, the District shall be entitled to enter a takeover contract to either remediate the unfinished condition or complete the Work for this Project.

14.2.4 Payments Withheld

If the District terminates the Contract for one of the reasons stated in Article 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is complete. All costs associated with the termination and completion of the Project shall be the responsibility of the Contractor and/or its Surety.

14.2.5 Payments upon Completion

If the unpaid balance of the Contract Sum exceeds costs of completing the Work, including compensation for professional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor and its Surety shall pay the difference to the District. The amount to be paid to the Contractor, or District, as the case may be, shall be certified by the Architect upon application. This payment obligation shall survive completion of the Contract.

GENERAL CONDITIONS

14.3 TERMINATION OF CONTRACT BY DISTRICT (CONTRACTOR NOT AT FAULT)

14.3.1 Termination for Convenience

District may terminate the Contract upon fifteen (15) calendar days of written notice to the Contractor and use any reasonable method the District deems expedient to complete the Project, including contracting with replacement contractor or contractors, if it is found that reasons beyond the control of either the District or Contractor make it impossible or against the District's interest to complete the Project. In such a case, the Contractor shall have no Claims against the District except for: (1) the actual cost for approved labor, materials, and services performed in accordance with the Contract Documents which have not otherwise been previously paid for and which are supported and documented through timesheets, invoices, receipts, or otherwise; and (2) profit and overhead of ten percent (10%) of the approved costs in item (1); and (3) termination cost of five percent (5%) of the approved costs in item (1). Contractor acknowledges and agrees that if the District (in its sole and absolute discretion) decides to takeover completion of the Project, the Contractor agrees to immediately assign all subcontracts to the District which the District has chosen to accept.

14.3.2 Non-Appropriation of Funds/ Insufficient Funds

In the event that sufficient funds are not appropriated to complete the Project or the District determines that sufficient funds are not available to complete the Project, District may terminate or suspend the completion of the Project at any time by giving written notice to the Contractor. In the event that the District exercises this option, the District shall pay for any and all work and materials completed or delivered onto the site for which value is received, and the value of any and all work then in progress and orders actually placed which cannot be canceled up to the date of notice of termination. The value of work and materials not otherwise already paid for by the District up to the time of termination under this Paragraph shall include a factor of fifteen percent (15%) for the Contractor's overhead and profit and there shall be no other costs or expenses paid to Contractor. All work, materials and orders paid for pursuant to this provision shall become the property of the District. District may, without cause, order Contractor in writing to suspend, delay or interrupt the Project in whole or in part for such period of time as District may determine. Adjustment shall be made for increases in the cost of performance of the Agreement caused by suspense, delay or interruption.

14.4 REMEDIES OTHER THAN TERMINATION

If a default occurs, the District may, without prejudice to any other right or remedy, including, without limitation, its right to terminate the Contract pursuant to Article 14.2, do any of the following:

- a. Permit the Contractor to continue under this Contract, but make good such deficiencies or complete the Contract by whatever method the District may deem expedient, and the cost and expense thereof shall be deducted from the Contract Price or paid by the Contractor to the District on demand;
- b. If the workmanship performed by the Contractor is faulty or defective materials are provided, erected or installed, then the District may order the Contractor to remove the faulty workmanship or defective materials and to replace the same with work or materials that conform to the Contract Documents, in which event the Contractor, at its sole costs and expense, shall proceed in accordance with the District's order and complete the same within the time period given by the District in its notice to the Contractor; or

GENERAL CONDITIONS

- c. Initiate procedures to declare the Contractor a non-responsible bidder for a period of two (2) to five (5) years thereafter.

All amounts expended by the District in connection with the exercise of its rights hereunder shall accrue interest from the date expended until paid to the District at the maximum legal rate. The District may retain or withhold any such amounts from the Contract Price. If the Contractor is ordered to replace any faulty workmanship or defective materials pursuant to Paragraph (b) above, the Contractor shall replace the same with new work or materials approved by the Architect and the District, and, at its own cost, shall repair or replace, in a manner and to the extent the Architect and the District shall direct, all Work or material that is damaged, injured or destroyed by the removal of said faulty workmanship or defective material, or by the replacement of the same with acceptable work or materials. In no event shall anything in this Article be deemed to constitute a waiver by the District of any other rights or remedies that it may have at law or in equity, it being acknowledged and agreed by the Contractor that the remedies set forth in this Article are in addition to, and not in lieu of, any other rights or remedies that the District may have at law or in equity.

GENERAL CONDITIONS

ARTICLE 15 DEBARMENT

15.1 DEBARMENT MEANS THERE HAS BEEN A FINDING THAT THE CONTRACTOR IS NOT RESPONSIBLE.

During the course of the Project, or if it is determined through Change Orders, Claims, or Audit that a Contractor is not responsible, the District may, in addition to other remedies provided in the Contract, debar the Contractor from bidding or proposing on, or being awarded, and/or performing work on District contracts for a specified period of time, which generally will not exceed five (5) years, but may exceed five (5) years or be permanent if the circumstances warrant such debarment. In addition to the debarment proceeding, a finding that a Contractor is to be debarred shall result in the termination of any or all existing Contracts the Contractor may have with the District.

15.2 BOARD FINDING

The District may debar a Contractor if the Board, or the Board's delegatee, in its discretion, finds the Contractor has done any of the following:

15.2.1 Intentionally or with reckless disregard, violated any term of the Contract with the District

15.2.2 Committed an acts or omission which reflects on the Contractor's quality, fitness or capacity to perform Work for the District;

15.2.3 Committed an act or offense which indicates a lack of business integrity or business honesty; or,

15.2.4 Made or submitted a false claim against the District or any other public entity.

15.3 HEARING AND PRESENTATION OF EVIDENCE

If there is evidence that the Contractor may be subject to debarment, the District shall notify the Contractor in writing of the evidence which is the basis for the proposed debarment and shall advise the Contractor of the scheduled date for a debarment hearing before the District Board or its delegated designee.

The District Board, or designee, shall conduct a hearing where evidence on the proposed debarment is presented. The Contractor or the Contractor's representative shall be given an opportunity to submit evidence at the hearing. The Contractor shall be provided an adequate amount of time to prepare and object to evidence presented. A tentative proposed decision shall be issued as a tentative decision and the District shall be entitled to modify, deny or adopt the proposed decision. The proposed decision shall contain a recommendation regarding whether the Contractor should be debarred, and, if so, the appropriate length of time of the debarment. The Contractor and the District shall be provided an opportunity to object to the tentative proposed decision for a period of 15 days. If additional evidence is presented, the District shall evaluate this evidence and either issue an amended ruling, issue the same ruling, or call a further hearing.

If a Contractor has been debarred for a period of longer than five (5) years, that Contractor may after the debarment has been in effect for at least five (5) years, submit a written request for review of the debarment determination to reduce the period of debarment or terminate the debarment. The District may,

GENERAL CONDITIONS

in its discretion, reduce the period of debarment or terminate the debarment if it finds that the Contractor has adequately demonstrated one or more of the following: (1) elimination of the grounds for which the debarment was imposed; (2) a bona fide change in ownership or management; (3) material evidence discovered after debarment was imposed; or (4) any other reason that is in the best interests of the District.

The District will consider a request for review of a debarment determination only where: (1) the Contractor has been debarred for a period longer than five (5) years; (2) the debarment has been in effect for at least five (5) years; and (3) the request is in writing, states one or more of the grounds for reduction of the debarment period or termination of the debarment, and includes supporting documentation. Upon receiving an appropriate request, the District will provide notice of the hearing on the request. At the hearing, the District shall review evidence on the proposed reduction of debarment period. This hearing shall be conducted and the request for review decided by the District pursuant to the same procedures as for a debarment hearing.

The District's proposed decision shall contain a recommendation on the request to reduce the period of debarment or terminate the debarment.

The terms shall also apply to Subcontractors of Contractor.

SUPPLEMENTARY GENERAL CONDITIONS

The following supplements modify the General Conditions. Where a portion of the General Conditions is modified and or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

ARTICLE 3 – THE CONTRACTOR

Article 3.10.4 Add the following: The Contractor shall require all Subcontractors to prepare and submit to the Contractor, within fifteen (15) days of execution of the Subcontract, comprehensive lists, in quadruplicate, 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 the Contractor's or Architect's approval.

SUPPLEMENTARY GENERAL CONDITIONS

Division 1 Forms

IMMEDIATE CONSTRUCTION CHANGE DIRECTIVE NO.

PROJECT: _____

TO: _____

You are hereby directed to provide the extra work necessary to comply with this ICD.

DESCRIPTION OF CHANGE: _____

COST (This cost shall not be exceeded): _____

TIME FOR COMPLETION: _____

NOTE:

Pursuant to Article 7.3.1.2 An Immediate Change Directive is a written order to the Contractor prepared by the Architect and signed by the District (and CM if there is a CM on the Project) and the Architect, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The District may by ICD, without invalidating the Contract, direct immediate changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions within. If applicable, the Contract Sum and Contract Time will be adjusted accordingly. **CONTRACTOR SHALL PROCEED WITH WORK SET FORTH IN THIS ICD IMMEDIATELY UPON RECEIPT OR THE DISTRICT MAY EITHER HOLD THE CONTRACTOR IN EITHER PARTIAL DEFAULT PURSUANT TO ARTICLE 2.2 OR TOTAL DEFAULT PURSUANT TO ARTICLE 14.**

Architect

District

SUPPLEMENTARY GENERAL CONDITIONS

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT: _____

TO: _____

As the Architect for the Project described above, the Project has reached Substantial Completion. Substantial Completion is not reached unless and until each of the following three (3) conditions have been met: (1) all contractually required items have been installed with the exception of only minor and Incomplete Punch Items (See Article 9.9 of the General Conditions); (2) All Fire/Life Safety Systems have been installed, and are working and signed off on the DSA Form 152 Inspection Card, all building systems including mechanical, electrical and plumbing are all functioning; and (3) the Project is fit for occupancy and its intended use

I certify that the Project has reached Substantial Completion as defined above on the following date:

_____..

Architect

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SCOPE

Work included: Construction of New Multi-Purpose Building and related site improvements; Fairmead Elementary School interface with the existing facilities and systems. Scope of Work is defined as all material, labor, equipment and services necessary to do all work shown on the drawings and called for in the Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-300 BID FORM
DIVISIONS 2 THRU 16

1.03 WORK UNDER OTHER CONTRACTS:

Coordinate all work under separate contracts as may be necessary to complete construction of subject project.

1.04 CONTRACTOR'S DUTIES:

- A. Except as specifically noted, provide and pay for:
 - 1. Labor, material and equipment.
 - 2. Tools, construction equipment and machinery
 - 3. Other facilities and services necessary for proper execution and completion of Work.
 - 4. Utilities: See Specification Section 01-500.

- B. Pay legally required sales, consumer and use taxes.

- C. Secure and pay for all site specifics, as necessary for proper execution and completion of Work, and as applicable at time of receipt of bids.
 - 1. Licenses.
 - 2. Permits and Fees.
 - 3. Governmental Fees.
 - 4. Royalties.
 - 5. Give required notices.

- D. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of Work.
 - 1. The contractor shall certify in writing that no materials containing Asbestos are incorporated in the work, in accordance with the Asbestos Hazard Emergency Regulations Act.
 - 2. Comply with Construction Oversight Process per PR 13-01 Division of the State Architect and Title 24, Part 1, CAC.

- E. Promptly submit written notice to Architect of observed variance of Contract Documents from legal requirements.
 - 1. Appropriate modifications to Contract Documents will adjust necessary changes.
 - 2. Assume responsibility for work known to be contrary to such requirements and without written notice to Architect or Engineer of observed variance.

- F. Enforce strict discipline and good order among employees. Do not imply on work:
 - 1. Unfit persons.
 - 2. Persons not skilled in assigned tasks.

- G. Changes and extra work.
 - 1. Any changes affecting building structure or fire ratings shall be by formal Revision, Addenda or Construction Change Document and will require approval by the Division of the State Architect, Access Compliance Section (ACS), Structural Safety Section (SSS) or Fire and Life Safety Section (FLS).

1.05 CONTRACTOR USE OF PREMISES:

- A. Confine operations at site to areas permitted by: Laws, Ordinances, Permits and Contract Documents.

- B. Do not unreasonably encumber site with materials or equipment.

- C. The “School Campus” during the school year; will remain in operation during the construction of subject improvement, The contractor shall coordinate the work to not disrupt the daily operations of the “School Campus”.

- D. Assume full responsibility for protection and safekeeping of Contractor’s and Owner’s materials stored on premises, and keep the Construction Area secure at all times.

- E. Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials.

- F. Move any stored products which interfere with operations of Owner.

- G. Obtain and pay for use of additional storage or work areas needed for operations.

- H. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

PART 2- PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

OWNER FURNISHED ITEMS

PART 1 - GENERAL

1.01 SCOPE:

- A. Provide all materials, labor, equipment, and services necessary to prepare for, and/or install those items indicated to be N.I.C. (not in contract) items complete as scheduled herein, unless specifically excluded.
- B. Material and Equipment to be installed:
 - 1. All items noted or scheduled to be F.B.O. and/or installed by others shall be furnished and installed by the Owner's sub-contractors on or in suitable sub-strates as prepared by the Contractor for those materials or trades scheduled.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

1.03 QUALITY ASSURANCE:

- A. Meet requirements and recommendations of applicable portions of Codes and Standards listed in Section 01-080:

1.04 SUBMITTALS:

The Owner shall provide shop drawings, piping and wiring diagrams and catalog data sheets for any items provided under this Section which differ in any respect to the items scheduled.

1.05 PRODUCT HANDLING:

- A. The Contractor shall accept delivery of any items and the responsibility for all items to be furnished to him by the Owner.
- B. When only a supporting device, or sub-assembly is to be installed by the Contractor the Owner shall provide only that portion and shall store and safeguard those portions to be installed later by others.
- C. All products shall be protected, handled, and stored in complete compliance with the manufacturer's printed instructions to protect the Owner from warranty infringements or loss of the full function of the items specified.

1.06 JOB CONDITIONS:

- A. Examine all preparatory work to determine its suitability and completeness. Notify the responsible Contractor of any deficiencies which must be corrected prior to installation.
- B. Be satisfied that all conditions affecting installation, operation or function are suitable for installation of the items scheduled.
- C. After installation, and acceptance by the inspector and the Architect, the Contractor shall provide protective guards, covers or barricades as required by the manufacturer.
- D. The Contractor shall promptly repair, refurbish, or replace items damaged by his operations to a condition satisfactory to the Owners representatives and at no cost to the Owner.

1.07 WARRANTY:

- A. The Contractor shall provide access to the installed items or prepared sub-strates for the inspection of the manufacturers representatives, for the purpose of affirming the warranties scheduled.
- B. All work shall be performed in full accordance with the manufacturers warranty requirements and all governing codes.

PART 2 - PRODUCTS

2.01 GENERAL

Refer to the Schedule under Article 3.02 of this section for products to be furnished to the Contractor.

PART 3 - EXECUTION

3.01 GENERAL

All items shall be installed in strict accordance with all requirements stated in the schedule for each item to be installed.

3.02 SCHEDULE:

- A. Product to be furnished by the Owner, coordinated and installed by the Contractor shall be as follows:

**01-018
OWNER FURNISHED ITEMS
PAGE 3**

BUILDINGS	WORK FURNISHED BY OWNER, COORDINATED AND INSTALLED BY CONTRACTOR

FIELD ENGINEERING

PART 1 - GENERAL

1.01 DESCRIPTION

Work included: Provide reference points necessary for proper layout of work.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

06-100 ROUGH CARPENTRY
DIV.15 MECHANICAL
DIV.16 ELECTRICAL

1.03 QUALITY ASSURANCE:

Surveyors shall be California licensed, trained and fully skilled to achieve accurate layouts within normal surveying tolerances. Project record Documents per Section 01-700 Project Closeout.
Surveyors shall utilize Total Station Survey Eqt. to perform survey tasks.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 COORDINATION:

- A. Coordinate layout of all work to ensure proper and adequate interface of Work.
- B. Establish general reference points of Bench Marks necessary to Layout Work.
- C. Coordinate Layout of Work performed under other Sections of these Specifications.

END OF SECTION

CUTTING AND PATCHING

PART 1- GENERAL

1.01 SCOPE

- A. The Contractor shall do all cutting, fitting or patching of existing construction and his work as may be required to make the several parts come together properly and ready to receive or be received by work of other contractors as shown, or reasonably implied by the drawings and specifications for the completed structure.
- B. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefor.
- C. The Contractor shall not endanger or damage any elements by cutting, excavating or otherwise altering any parts of the existing construction shown to remain; and shall not cut or alter the work of any other contractor unless specifically directed to do so by the Architect.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

GENERAL CONDITIONS
SUPPLEMENTAL GENERAL CONDITIONS

PART 2- PRODUCTS

(NOT APPLICABLE)

PART 3- EXECUTION

(NOT APPLICABLE)

END OF SECTION

CODES AND STANDARDS

PART 1 - GENERAL

1.01 STANDARDS:

- A. References to standards, codes, specifications, recommendations and regulations, refer to the latest edition or printing in effect at the date of issue shown in the Documents unless other date is implied by the suffix number of the Standards.
- B. Applicable portions of the Standards listed that are not in conflict with the Contract Documents shall be construed as specifications for this work.

1.02 GENERAL STANDARDS:

ANSI	American National Standards Institute
ASAI	American Standards Association, Incorporated
ASTM	American Society for Testing and Materials
CS	Commercial Standards of the U.S. Department of Commerce
EPA	Environmental Protection Agency
FM	Factory Mutual
FS	Federal Specifications
IS	Industrial Standards of the U.S. Department of Commerce
NBS	National Bureau of Standards
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety and Health Administration
PS	Product Standards of the U.S. Department of Commerce
CBC	California Building Code
UL	Underwriters Laboratory, Incorporated
WH	Warnock Hersey

1.04 APPLICABLE CODES:

- A. All Codes, laws, ordinances, rules, regulations, orders and other legal requirements of City, County, State, Federal and other public authorities which bear on performances of Work shall be applicable to Project. Latest editions shall be applicable unless specified otherwise.
- B. Relationship between Applicable Codes and Contract Documents: The Contract Documents have been developed with the intent to conform with applicable codes. Nothing within the Contract Documents shall be construed to permit Work not conforming with applicable codes.

1.05 MAJOR GOVERNING CODES AND REGULATIONS:

All work shall comply with the Title 24 California Code of regulations (CCR) requirements of the following codes and regulations. Special reference in other Sections of the Specifications to a specific code will be by use of the abbreviation given in front of the Code.

Title 8, CCR, Industrial Safety.

Title 19 CCR, Public Safety, State Fire Marshall Regulations

Title 24, CCR, Part 1, Administrative Regulations and Standards

Title 24, CCR, Part 1, 2022 Building Standards Administrative Code

Title 24, CCR, Part 2, 2022 CBC. Vol. 1 & 2 (2021 IBC as amended by California).

Title 24, CCR, Part 3, 2022 CEC. (2020 NEC as amended by California).

Title 24, CCR, Part 4, 2022 CMC. (2021 UMC as amended by California).

Title 24, CCR, Part 5, 2022 CPC. (2021 UPC as amended by California).

Title 24, CCR, Part 9, 2022 CEC. 2021 Energy Code.

Title 24, CCR, Part 9, 2022 CFC. (2021 IFC as amended by California).

Title 24, CCR, Part 11, 2022 CGBSC (CALGreen).

Title 24, CCR, Part 12, 2022 CRS.

Comply with CFC Chapter 33-Fire Safety during Construction & Demolition.

AQMCD Air Quality Management Control District in the area where the project is located.

NFPA 13 Automatic Sprinkler Systems 2022 Edition.

NFPA 14 Standpipe Systems (2019 CA Amended)

NFPA 72 National Fire Alarm Code (2022 CA Amended)

** A copy of these codes shall be at the job site at all times.

1.06 GOVERNING AUTHORITY:

The provisions of the State of California, Statues of 1933, Chapter 59, Safety of Construction of Public School Buildings Act and the latest regulations based thereon of the Division of the State Architect of the State of California shall be the governing authority and shall take precedence over the other applicable codes.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

(Not Applicable)

END OF SECTION

ABBREVIATIONS, SYMBOLS AND DEFINITIONS

PART 1 - GENERAL

1.01 GENERAL:

- A. The abbreviations, symbols and work meanings not defined in the Contract Documents are in accordance with building industry usage and convention. Questions which arise as to meaning or intent shall be referred to the Architect prior to bidding for interpretation.
- B. Refer to Drawings for additional abbreviations and symbols.
- C. Refer to General and Supplemental Conditions and specific specification Sections for additional definitions.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

- 00-700 GENERAL CONDITIONS
- 00-750 SUPPLEMENTAL GENERAL CONDITIONS

1.03 DEFINITIONS:

- EXECUTE Perform what is required to install, apply, erect and otherwise incorporate products into this Project.
- FURNISH Supply products required, deliver to Project, unload, store and install as required in location as directed by Contractor, Owner or Architect.
- INSTALL Incorporate into this Project.
- PRODUCTS The material, equipment, fixtures and other physical substances required to execute the Project.
- WARRANTY Use of the term or the word GUARANTEE will be recognized interchangeably and have the same definition that a WARRANTY is an assurance by the seller or installer that products or Work are as represented or will be as promised in compliance with Specifications.

PART 2 - PRODUCTS

(NOT APPLICABLE)

PART 3 - EXECUTION

(NOT APPLICABLE)

END OF SECTION

SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL:

- A. The Contractor shall check, verify, and be responsible for all field measurements.
- B. The Contractor shall submit copies as scheduled below, checked and approved by him for all shop drawings and schedules required for the work of the various trades. Submittals shall be delivered promptly so delays in delivery of materials or execution of the work will be avoided.
- C. The Architect will make any desired corrections with reasonable promptness, and return the submittal to the Contractor.
- D. The Contractor shall make any corrections required by the Architect and submit the required corrected copies for final review and distribution.
- E. The Architect's review of such drawings or schedules shall not relieve the Contractor of responsibility for deviations from the drawings or specifications, unless he has, in writing, called the Architect's attention to such deviations at the time of original submissions, and secured written approval. The Architect's review shall be as complete and thorough as possible, but shall not be construed as an "approval", or to relieve the Contractor(s) and material suppliers of responsibility for errors or omissions in the submitted documents.
- F. The Contractor shall submit to the Architect a shop drawing and submittal time schedule indicating when the required shop drawings and submittals will be submitted to the Architect. The schedule shall be submitted within fourteen (14) days after date of the Notice to Proceed.

1.02 REQUIRED QUANTITIES AND DEFINITIONS:

- A. The following list of items, definitions and required quantities is a minimum required for this project. Verify with Division 15 and Division 16 sections for additional quantities required within those divisions.
 - 1. All submittals shall be submitted electronically as well as hard copies, Brochures, product information, color choices and/or manufacturer's catalog sheets shall be submitted in sequential sets for each category of work:
 - a. Provide one (1) hardcopy set.
 - 2. Shop Drawings: Newly prepared information, drawn to accurate scale - do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings, as standard information prepared without specific reference to the Project is not considered Shop Drawings.
 - a. Provide reproducible copies for each sheet or detail.

3. Samples of finish materials:
 - a. Provide a minimum of three (3) samples for each.
4. Manufactured devices or equipment items:
 - a. One (1) sample, returned to supplier and which, when approved, may be incorporated into the Project.
5. Color samples shall be submitted on 8-1/2" x 11" cards for all colors scheduled in paint types specified:
 - a. Provide three (3) samples of each color/paint type.
6. Operating Maintenance Manuals shall be submitted for all equipment items.
 - a. Provide a minimum of three (3) copies unless otherwise noted.
7. DSA Progress Reports:

Contractor shall comply with all current Governing Agency DSA requirements including DSA IR A-6 Submittals and Approval Process.

Contractors shall submit Verified Reports on prescribed form per Title 24, Part 1, CCR.

1.03 SUBMITTAL SCHEDULE:

Submittals required by the various sections of the Specifications include, but are not necessarily limited to:

<u>SECTION NUMBER</u>	<u>SUBMITTALS</u>
	NON-ASBESTOS COMPLIANCE CERTIFICATE (See General Conditions)
01-310	CONSTRUCTION SCHEDULE
01-370	SCHEDULE OF VALUES
01-410	TEST REPORTS
01-640	SUBSTITUTIONS
01-700	PROJECT CLOSEOUT DOCUMENTATION
01-720	PROJECT RECORD DOCUMENTS, TEST REPORTS
01-740	WARRANTIES
02-280	PRODUCT DATA
02-513	PRODUCT DATA, CERTIFICATES
03-200	PRODUCT DATA
03-251	PRODUCT DATA
03-300	PRODUCT DATA, MIX DESIGN, TEST REPORTS
05-100	SHOP DRAWING'S, PRODUCT DATA

<u>SECTION NUMBER</u>	<u>SUBMITTALS</u>
06-100	COMPLIANCE CERTIFICATE, PRODUCT DATA
06-180	PRODUCT DATA, COMPLIANCE CERTIFICATE
06-200	PRODUCT DATA, SAMPLES
06-412	SHOP DRAWINGS, COLORS, CERTIFICATE OF COMPLIANCE
07-200	PRODUCT DATA
07-311	PRODUCT DATA, COLORS
07-410	PRODUCT DATA
07-513	PRODUCT DATA, SYSTEM COMPLIANCE CERTIFICATE, GUARANTEE
07-600	PRODUCT DATA, GUARANTEE
07-900	PRODUCT DATA, COLORS
08-100	PRODUCT DATA, SHOP DRAWINGS
08-305	PRODUCT DATA
08-700	PRODUCT DATA AND MATERIAL LIST
08-800	PRODUCT DATA
09-100	PRODUCT DATA
09-250	PRODUCT DATA, SAMPLES
09-300	PRODUCT DATA, SAMPLES, COLORS
09-510	PRODUCT DATA, SAMPLES
09-660	PRODUCT DATA, SAMPLES, COLORS
09-671	PRODUCT DATA, COLORS, SAMPLES
09-900	PRODUCT DATA, MATERIAL LIST, SAMPLES, COLORS
09-975	PRODUCT DATA, SAMPLES, COLORS
10-050	PRODUCT DATA
10-100	PRODUCT DATA
10-422	PRODUCT DATA
10-520	PRODUCT DATA
10-800	PRODUCT DATA
14-415	SHOP DRAWINGS, PRODUCT DATA, WARRANTIES
15-400	PRODUCT DATA, SHOP DRAWINGS, MANUALS, PROJECT RECORD DOCUMENTS, OPERATIONS DATA AND GUARANTEES
16-000	PROJECT DATA, SHOP DRAWINGS, MANUALS, PROJECT RECORD DOCUMENTS, OPERATIONS DATA AND GUARANTEES

END OF SECTION

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
1. Provide projected Construction Schedule for entire Work and revise periodically.
 2. Provide separate subschedule, showing Shop Drawing Submittals.
 3. Provide subschedule to define critical portions of entire schedule.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
01-300	SUBMITTALS
01-410	TESTING LABORATORY SERVICES

1.03 SUBMITTALS:

- A. Submit initial schedule within 15 days after date of Notice to Proceed or at Preconstruction conference, whichever comes first.
- B. Submit updated schedules as required by change in Work Progress.

PART 2 - PRODUCTS

2.01 CONSTRUCTION SCHEDULE FORM:

- A. Prepare in form of horizontal bar chart.
1. Provide separate horizontal box column for each trade or operation.
 2. Order: Chronological order of beginning of each item of Work.
 3. Identify each column.
 - a. By specification section number.
 - b. By distinct graphic delineation.
 4. Horizontal time scale: Identify first workday of each week.
 5. Scale and spacing: To allow space for updating.
- B. Sheet size and type: 11" x 17", reproducible.
- C. Content of Construction Schedule Form.
1. Provide complete sequence of construction by activity.
 2. Identify Work of separate, logically grouped activities.

PART 3 - EXECUTION

3.01 INITIAL SCHEDULE SUBMITTALS:

- A. Architect will review schedules and return within 10 days after receipt.
- B. If required, resubmit within 7 days after return of review copy.

3.02 UPDATING:

- A. Show all changes occurring since previous submission of updated schedule.
- B. Indicate progress of each activity and show completion dates.

3.03 DISTRIBUTION:

- A. Print copies of schedules for distribution.
- B. Distribute copies of reviewed schedules to:
 - 1. Job site file.
 - 2. Sub-contractors.
 - 3. Other concerned parties.
- C. Instruct recipients to report any inability to comply and provide detailed explanation with suggested remedies.

END OF SECTION

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Work included:
1. Provide a Schedule of Values assigned to the various portions of the Work.
 2. Upon request by Architect, support values given with data that will substantiate their correctness.
 3. Use of the Schedule of Values will be the basis for reviewing the Contractor's Application for Payment. No payment will be made without the Architect's review and approval of the Schedule of Values.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

- | | |
|--------|---------------------------------|
| 00-700 | GENERAL CONDITIONS |
| 00-750 | SUPPLEMENTAL GENERAL CONDITIONS |
| 01-310 | CONSTRUCTION SCHEDULES |

1.03 FORM OF SCHEDULE:

- A. Use the Table of Contents of the Contract Documents as a basis for the format for listing divisions of the Work per Building; Using the Schedule of Values on AIA Form G702A.
1. Identify each item with the number and title as listed in the Table of Contents of the Construction Documents.
 2. Sheet Size: 8-1/2 x 11 inches.

1.04 CONTENT OF SCHEDULE:

- A. Itemize separate line item cost for each of the following:
1. DIVISION 00 through DIVISION 01 General Cost Items:
 - a. Performance Bond and Labor and Material Bond.
 - b. Field Supervision and Layout.
 - c. Temporary Utilities, Controls and Buildings.
 - d. Project Identification Sign.
 2. DIVISION 02 through DIVISION 16 cost items:
 - a. Cost for Work required by each Section, provide a separate amount for labor and material.
 - b. Cost for a portion of the Work required by a Section when required for proper Division of payment or by this specification.
- B. Breakdown costs into:
1. Delivered cost of product(s) including tax.
 2. Total installed cost with overhead and profit.
- C. Sum of total costs listed in Schedule shall equal total Contract Sum.

1.05 SUBMITTAL:

- A. Submit Schedule of Values to Architect:
 - 1. Minimum of 30 days prior to submitting first Application for Payment.
 - 2. Architect will review Schedule.
 - 3. Revise Schedule as required by Architect.
 - 4. No review of an Application for Payment will be undertaken without an approved Schedule of Values.

PART 2 - PRODUCTS

Schedule of Values as indicated in Part 1.

PART 3 - EXECUTION

Schedule of Values as indicated in Part 1.

END OF SECTION

TESTING LABORATORY SERVICES

PART 2 - GENERAL

1.01 DESCRIPTION:

- A. Work Included:
 - 1. The Contractor is to provide access, assistance and information required for testing of the various portions of the Work as required by regulatory agencies, planning, building and other governmental inspectors, the Contract Documents and the Owner.
 - 2. The Owner shall pay for all testing except as specified otherwise in the schedule at the end of this section. Cost of re-testing shall be back-charged to the Contractor.

1.02 WORK NOT INCLUDED:

- A. Testing laboratory will be LEA Certified, employed by the Owner and will be approved by the Architect and DSA.
- B. Payment for initial testing for tests specifically indicated as paid by Owner, will be by Owner.

1.03 QUALITY ASSURANCE:

- A. Requirements of Regulatory Agencies: In accordance with Section 01-080 Applicable Codes.
- B. Testing Standards: In accordance with regulatory agencies and appropriate ASTM Standards.
- C. Comply with Construction Oversight Process per PR 13-01 Division of the State Architect and Title 24, Part 1, CAC.

1.04 CONTRACTOR'S DUTIES:

- A. Testing
 - 1. In cooperation with testing laboratory's schedule of required testing.
 - 2. Provide facilities required for access.
- B. Inspections and tests required shall be the responsibility of and shall be paid for by the Owner unless specified otherwise.
- C. Inspections and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.
- D. Test Reports: Distribute test reports and related instruction to insure all required retesting and/or replacement of materials. All samples, specimens, and tests shall be made by a properly qualified person or testing laboratory, selected by Owner with approval from the Architect and D.S.A., who shall furnish the California Division of the State Architect with reports, showing the result of tests and stating that they were made in accordance with the specified provisions. All tests as well as sampling and preparation of samples shall be in accordance with the Standards adopted by the A.S.T.M. One copy of all test reports shall be sent to the California Division of the State Architect.
- E. Payment of Testing: All testing shall be paid for by the Owner. Backcharge shall be made to the Contractor for retesting or extra testing required because of initial failures.
- F. Overtime Costs: Whenever Contractor elects to work during hours other than normal work week and laboratory inspection is required, District will pay normal cost of laboratory inspection and Contractor shall pay that portion of laboratory inspection cost due to overtime.

1.05 TESTING LABORATORY'S DUTIES:

- A. Taking all specimens.
- B. Perform tests.
- C. Writing test reports.
- D. Distribute test report to Owner, Architect (2 Copies), Engineer, Inspector, Contractor, and Division of the State Architect.
- E. All fills used to support the foundations of any building or structure shall be placed under the direction of a geotechnical engineer, and the placement of the fill shall be inspected by the geotechnical engineer or his or her qualified representative. It shall be the responsibility of such geotechnical engineer to see that the procedures used in placing fills meet the requirements of the specifications and to coordinate all fill inspection and testing during the construction involving such fills.
- F. The duties of the geotechnical engineer shall include, but need not be limited to, the observation of cleared areas and benches prepared to receive fill; observation of the removal of all unsuitable soils and other materials; the approval of soils to be used as fill material; the inspection of placement and compaction of fill materials; the testing of the completed fills; and the inspection or review of geotechnical drainage devices where required by the soils investigation, buttress fills or other similar protective measures.
- G. A verified report shall be submitted to the enforcement agency by the geotechnical engineer. The report shall indicate that all the tests required by the plans and specifications were completed and that the tested materials were in compliance with the plans and specifications and the recommendations of the soils investigation report.

PART 2 - PRODUCTS

2.01 TESTING SCHEDULE:

Testing Schedule at the end of this section should be used as a guide only and it is not considered a complete list. Refer to regulatory agency requirements and specific specification section for complete testing requirements.

PART 3 - EXECUTION

3.01 TEST REPORTS

As indicated in Part 1.

TESTING SCHEDULE

<u>SECTION/NAME</u>	<u>TEST</u>	<u>PAID BY</u>
02-200 Earthwork	1. Compaction Test 2. Evaluate Imported Fill Samples	Owner Owner
03-200 Concrete Reinforcement	1. Rebar Material 2. Continuous Inspection of Welds	1. Owner 2. Owner
03-251 Post-Installed Concrete Anchors	1. Tension & Torque	1. Owner
03-300 Cast-In-Place Concrete	1. Cement Material 2. Aggregate Material 3. Concrete Mix 4. Weighmaster Continuous Batch Plant Inspection 5. Concrete Compression Test	1. Owner 2. Owner 3. Owner 4. Owner 5. Owner
05-100 Structural Metal and Metal Fabrication	1. Steel Material 2. High Strength Bolts and Installation 3. Shop and Field Welding	1. Owner 2. Owner 3. Owner
09-510 Acoustical Ceilings	Main and cross runners, intersection connectors & expansion devices	Contractor
15-400 Plumbing	1. Non-Leaking System 2. Bacteriological Purity	1. Contractor 2. Contractor
15-650 Heating, Ventilating and Air Conditioning	1. Equipment Operation 2. Air Temperature and Quality	1. Contractor 2. Contractor
16-300 Electrical Service and Distribution	1. Equipment Operation 2. Protective Systems	1. Contractor 2. Contractor

END OF SECTION

OWNER'S INSPECTION SERVICES

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Work Included: Provide access, facilities and information required for Owner's inspection of Project.
- B. Selection and payment of Owner's inspection services will be by Owner. Inspector will be employed by the Owner and approved by the Architect, Structural Engineer and DSA/SSS.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

NOT APPLICABLE

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS

1.04 QUALITY ASSURANCE:

- A. Requirements of Regulatory Agencies: In accordance with Section 01-080 Applicable Codes.

1.05 CONTRACTOR'S DUTY:

- A. Furnish facilities in accordance with Section 01-500 Temporary Facilities.
- B. Provide Owner's Inspector free access to any and all parts of the Project at all times.
- C. Provide Owner's Inspector information necessary to keep him fully informed with respect to the progress and manner of Work and character of Work.
- D. Perform no Work in absence of Owner's Inspector unless alternate arrangements have been made in advance and agreed to by Owner, Architect and DSA.
- E. Owner's Inspection of Work shall not relieve Contractor from any conditions of this Contract.
- F. Comply with Construction Oversight Process per PR 13-01 Division of the State Architect and Title 24 Part 1, CAC.

1.06 OWNER'S INSPECTOR DUTIES:

- A. Provide inspection of Work (including "Continuous Inspection") as required in CCR-T24, Part 1, Section 4-333 and in accordance with General Conditions.
- B. Report to Owner, Architect and DSA/SSS as required.

**PART 2 & 3 - PRODUCTS AND EXECUTION
(NOT APPLICABLE)**

END OF SECTION

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SCOPE:

- A. Provide all material, labor, equipment and services necessary to furnish and install Temporary Facilities and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

02-100 CLEARING AND DEMOLITION
DIV. 21, 22, 23 MECHANICAL
DIV. 26, 27, 28 ELECTRICAL

1.03 STANDARDS:

- A. In accordance with 01-080 CODES AND STANDARDS.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The following list of services and facilities shall be provided and maintained throughout the construction period, by the Contractor or by the Owner where specifically noted. The contractor shall assume all responsibility for the provision and maintenance of these facilities and services and for the provision of public safety where the operations under this contract interface with public areas. These facilities and services shall include the following items: Temporary heat, water, power, telephone, fax and sanitary facilities; access and service road; construction fencing enclosures; storage buildings and enclosures; site office; project signs; noise, dust and traffic control services.

2.02 TEMPORARY HEAT:

- A. Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity.

2.03 WATER:

- A. The Owner shall arrange and pay for all water supply for all purposes of construction at a location to be designated at the site. Extensions within the site shall be provided by the Contractor and maintained in a safe and efficient manner.

2.04 TELEPHONE & FAX MACHINE:

- A. The Contractor shall arrange for use of a telephone line. The Contractor shall provide telephone and fax machine and pay for all charges.

2.05 ELECTRIC SERVICE:

- A. Electrical power is available at the site and will be paid for by the Owner, for all purposes of power and lighting for construction. Maintain such service until completion of contract.
- B. Contractor will provide electrical energy to all subcontractors as required on or about the premises.

2.06 SANITARY FACILITIES:

- A. Provide adequate, self-contained toilets as required for all persons employed on Project.
- B. In no case shall the permanent plumbing fixtures of Project be used for this purpose.

2.07 ACCESS FACILITIES:

- A. Provide such access facilities to the construction areas as are necessary and required for carrying on the work and they shall be kept passable at all times. The contractor shall be responsible for any damage to streets, curbs and sidewalks due to the use of such facilities, and such damaged portions shall be repaired as required to place them in a good condition as existed before commencement of the work.

2.08 STORAGE SHEDS AND FENCES:

- A. As required by the contractors to protect materials, construction work, and their operations from weather, vandalism, theft, and to exclude the intrusion of the public into the construction area.

2.09 CONTRACTOR'S FIELD OFFICE:

- A. Provide office trailer 8' x 20' min. with space for inspector.

2.10 PROTECTION:

- A. Install and maintain temporary walls, barricades, canopies, warning signs, steps, bridges, platforms and other temporary construction necessary for proper completion of Work and in accordance with regulatory agencies and pertinent safety regulations.

2.11 PROJECT ENCLOSURE:

- A. Install and maintain enclosures around the Project to exclude and protect the public and to protect the completed Work.

2.12 TRAFFIC CONTROL:

- A. Conduct Work so as not to interfere unnecessarily with adjacent roads, streets, drives and walks and as required by local authorities. Provide and maintain access facilities as required to perform Work.

2.13 DUST CONTROL:

- A. Perform Work in such a manner as to minimize the spread of dust and flying particles. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to public and neighbors.

2.14 SIGNS:

The General Contractor shall furnish and erect at location as directed by the Architect one sign board approximately 4 feet x 8 feet, fabricated of 3/4 inch exterior grade plywood with a sturdy frame attached to 4 inch x 4 inch x 14 foot redwood posts set 4 feet in the ground minimum, and substantially braced. The sign to be painted on signboard shall be of design in 4 colors as directed by the Architect. Lettering shall be of style shown, neatly executed by a skilled sign painter. The information to be lettered on sign shall be as furnished by the Architect. Sign will include the names of the Contractor, the Owner, the Architect, and the project designation. No other signs will be allowed on the Project.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS:

- A. Perform Work and provide and maintain services and facilities in accordance with the requirements of all regulatory agencies having jurisdiction. Remove services, facilities and temporary connections upon completion of the Project.
- B. Services to be provided and maintained from commencement of Work until final acceptance.

3.02 CLEARING SITE:

- A. The Contractor shall remove debris, concrete and asphaltic concrete walks, and paving to the extent indicated on the drawings; and any other obstruction on this site before proceeding with the Work. Unless otherwise indicated, all such items shall be disposed of by the Contractor away from the premises.
- B. Prior to starting Work, the Contractor shall notify the Architect of his intent to commence work. Hose bibbs, utility lines, etc., to be abandoned within the construction area shall be removed by the Contractor and stubbed off outside the limits of construction.
- C. Refer to drawings showing utilities to remain within the construction area and special construction indicated for their protection. If, during excavation of site, utility lines are uncovered (water, electric, sewer, etc.) not shown on the drawings, Work must stop and Architect notified promptly for his review and action.

3.03 GRADES, LINES AND LEVELS:

- A. Locations and elevations of the structure to be built under this contract are shown on the drawings, and unless any inconsistency therein is brought to the attention of the Architect, in writing, prior to commencement of structural operations, the Contractor will be held responsible for the proper locations and elevations as intended.

3.04 USE OF PROPERTY:

- A. Contractors shall cooperate with other contractors and the Owner in the use of the site facilities and shall adjust their operations to maintain harmonious relations and uninterrupted progress of the Work.

3.05 CLEANING UP:

- A. The Contractor shall at all times keep the premises free from accumulations of waste materials or rubbish caused by his employees or Work, and at the completion of the Work he shall remove all his rubbish from and about the building and all his tools, scaffolding and surplus materials and shall leave his work “broom clean” or its equivalent.

END OF SECTION

SUBSTITUTIONS

PART 1 - GENERAL

1.01 SCOPE:

- A. Work Included: Work substituted for Work specified in DIVISIONS 02 through 16 shall meet the requirements of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-300 SUBMITTALS

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS.

1.04 SPECIFIED WORK:

- A. Contractor's Options:
1. Product specified only by reference standards: Select any product meeting standards.
 2. Product specified by naming several products and/or manufacturers: Select any product and/or manufacturer named.
 3. Product specified by naming only product: Select product specified.
 4. Product specified by naming one or more products and stating "or equal to" or "approved equivalent" with the specified product: Select any product named or submit request for substitution for any product not specifically named in accordance with Article 01-640/1.05 Substitution Request.

1.05 SUBSTITUTION REQUEST:

- A. Cost of Contractor for review of Substitution Request:

1. There will be no charge to the submitter (Contractor or Bidder) for review of the initial submittal if the initial submittal is complete and in strict accordance with Division 01-640 SUBSTITUTIONS, and if the review can be completed within two hours.
Review time on the initial submittal which exceeds two hours, and time for review

of

re-submittal(s) will be billed to the submitter (Contractor or Bidder) at an hourly rate of \$120.00 an hour with a two (2) hour minimum for each submittal or re-submittal whether approved or rejected.

- a. Time-billed for review shall include the Architect, Engineering Consultants for this project, laboratory services and/or special consultants, which in the Architect's opinion are necessary to make an adequate determination of substantial compliance.
2. Payment to the Architect for review of Substitution Requests shall be due and payable within 30 days of invoice to the submitter (Contractor or Bidder), or prior to review of resubmittals on the same items, which ever comes first.
3. The Owner shall have the right to withhold from any Project Payment Request due the Contract Moneys owed the Architect from outstanding billings for services rendered for reviewing Substitution Requests.

- B. Content Of Request:
1. Complete the attached Substitution Request Form substantiating compliance of proposed substitution with Contract Documents.
 2. For products, attach to the Substitution Request Form:
 - a. Product Identification, including manufacturer's name and address.
 - b. Manufacturer's literature including product description, performance and test data and reference standards.
 - c. Samples.
- C. In making request for substitution, Contractor attests that:
1. Contractor has personally investigated proposed product or method, and determined that it is equal or superior in all respects to the specified.
 2. Contractor will provide the same guarantee or warranty for substitution as for product or method specified.
 3. Contractor will coordinate installation of accepted substitution into Work, making such changes as may be required for Work to be complete in all respects.
 4. Contractor waives all claims for additional costs related to substitution which subsequently become apparent.
- D. Submit 3 copies of substitution request prior to submittals required in accordance with Section 01-300 Product Submittals.

1.06 ACCEPTANCE OF SUBSTITUTIONS:

- A. Procedures:
1. The Contract is based on materials, equipment and methods described in the Contract Documents.
 2. Architect will consider proposals submitted in accordance with Article 30 of General Conditions Substitutions.
 3. Architect is solely responsible for judging the acceptance of substitutions.
 4. Substitutions will not be considered if:
 - a. They are indicated or implied on product submittals without formal request.
 - b. Acceptance will require substantial revision of Contract Documents.
 5. Substitute products shall not be ordered without written acceptance of Architect, Owner and DSA.

PART 2 - PRODUCTS

2.01 SUBSTITUTION REQUEST FORM

See the form attached to the end of this section.

PART 3 - EXECUTION

3.01 GENERAL

The attached one page form will be reproduced by the Contractor for any and all proposed substitutions.
No other forms will be accepted.

SUBSTITUTION REQUEST FORM

TO: **GONZALEZ ARCHITECTS**
 7545 N. DEL MAR AVE., SUITE 203
 FRESNO, CALIFORNIA 93711

WE HEREBY SUBMIT FOR YOUR CONSIDERATION THE FOLLOWING PRODUCT OR METHOD AS
SUBSTITUTION FOR THE SPECIFIED ITEM FOR THIS PROJECT:

PROJECT: _____

SPECIFIED
ITEM: _____

Section	Page	Paragraph	Description

PROPOSED CREDIT IF ANY: _____

The undersigned request consideration of the following:

PROPOSED SUBSTITUTION:

SUB'D BY:
SIGNATURE _____
FIRM: _____
DATE: _____

DESIGN CONSULTANT REVIEW:
BY: _____
DATE: _____
REMARKS: _____

END OF SECTION

CHANGE ORDERS

PART 1 - GENERAL

1.01 SCOPE:

- A. Work Included: Work Change Orders for Work specified in DIVISIONS 02 through 16 shall meet the requirements of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-100	INSTRUCTIONS TO BIDDERS
00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
01-300	SUBMITTALS

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS.

1.05 CHANGE ORDER:

- A. Changes, deletions or additions shall be made only through a standard written order of the Architect and approved by the Board of the District.
- B. Change orders shall be issued only before or at the time of change and the expense or responsibility for any change or damage without said order shall rest entirely with the Contractor. The signature of Owner and Architect is required on all change orders.
- C. DSA: Only Construction Change Documents, CCD's, are to be submitted to DSA in accordance with IRA-6.

END OF SECTION

ADDENDA

PART 1 - GENERAL

1.01 SCOPE:

- A. Work Included: Work specified in DIVISIONS 02 through 16 shall meet the requirements of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-100	INSTRUCTIONS TO BIDDERS
00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
01-300	SUBMITTALS

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS.

1.05 ADDENDA:

Changes, deletions or additions shall be made only through a standard written order of the Architect and approved by the Board of the District and Division of the State Architect.

END OF SECTION

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Work Included:
1. Project cleanup and coordination of all cleaning work under all sections of this specification.
 2. Collection of and processing for delivery to the Architect or Engineer of all as-built drawings required under the various sections of the specifications.
 3. Compile and assemble all operation data, maintenance manuals, and parts lists for all equipment items provided for this project; two copies each.
 4. Start-up of all mechanical, electrical, and miscellaneous equipment items; and adjustments required for the performance specified.
 5. Compile and assemble all guarantees, warranties, or other written documentation to establish the requirements outlined under all sections of this specification.
 6. Repair and touch-up on all items damaged during the construction and handling processes.
 7. Furnish maintenance material and spare parts as specified within Divisions 2 through 16 of these specifications.
 8. Deliver to the Architect or Engineer all assembled copies of those items required in Articles 1 through 6 above for presentation to the Owner.
- B. It shall be the responsibility of the Contractor to provide all labor and materials necessary to achieve completion of the items listed under Article 1.01 A above, although certain items may be specified under the work of other trades. Periodic removal of debris, cleaning, repair and testing of items in various areas of the construction site shall be carried out under the direction of the Contractor.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-010 SUMMARY OF WORK
DIVISION 2 through 28.

1.03 QUALITY ASSURANCE

- A. Safety, Fire, and Environmental Protection and Insurance standards shall be strictly adhered to in all phases of the construction work. It shall be the responsibility of the Contractor to determine the standards applicable to this project as set forth in all codes, regulations, and ordinances having jurisdiction, and as set forth elsewhere in the specifications.
- B. All specific requirements stipulated in, or required by, code references included under all sections of Divisions 2 through 16 inclusive of this Specification, and as detailed under this Contract.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS:

Use only those specific materials or types of materials recommended and approved by the manufacturer of the item to be cleaned.

2.02 TOUCH-UP MATERIALS:

Use only those materials furnished by or as recommended and approved by the manufacturer of the item to be touched up. Colors and finish characteristics shall exactly match the base material, and extra materials, labor, and services required to achieve this result shall be provided by the Contractor(s).

2.03 REPLACEMENT MATERIALS:

- A. Materials that are damaged and not repairable, or materials that are destroyed shall be replaced with equivalent and identical materials of the same manufacture and shall function in conjunction with the remaining portions of that material. Items no longer manufactured or available shall be replaced with comparable materials as approved by the Architect or Engineer and at no additional cost to the Owner.
- B. Materials that are required for maintenance replacement by the owner after the guarantee period has expired, or by the Contractor during the guarantee period shall exactly match those materials installed as to make, style, color lot, etc. under this Contract and shall be delivered to the Owner in marked, identified containers.

PART 3 - EXECUTION

3.01 CLEAN-UP WORK:

- A. During Construction:
 - 1. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish.
 - 2. Sprinkle dusty debris with water.
 - 3. At reasonable intervals during progress of work, clean-up site and access and dispose of waste materials, rubbish, and debris.
 - 4. Provide suitable containers and locate on site for collection of waste materials, rubbish, and debris.
 - 5. Do not allow waste materials, rubbish, and debris to accumulate and become an unsightly or hazardous condition.
 - 6. Remove waste materials, rubbish, and debris from the site and legally dispose of at public or private dumping areas off the Owner's property.
 - 7. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy.
 - 8. Lower waste materials in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.
 - 9. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

- B. Final Cleaning:
1. Use experienced professional cleaners for final cleaning.
 2. At completion of construction and just prior to acceptance or occupancy, conduct a final inspection of exposed interior and exterior surfaces.
 3. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from interior and exterior surfaces.
 4. Repair, patch, and touch-up marred surfaces to match adjacent finishes.
 5. Broom clean paved surfaces, rake clean other surfaces of grounds.
 6. Maintain cleaning until the building or portion thereof is accepted by the Owner.

3.02 START-UP WORK:

- A. During Construction and as each piece of equipment is installed, provide the following tests:
1. Verify that all external service connections have been properly completed, and that piping and/or wiring is properly sized, and contain all necessary safety devices.
 2. Verify that the equipment is free of shipping materials, tie downs, or other internal obstructions.
 3. Conduct tests employing the manufacturer's operating instructions as a sequential guide.
 4. Verify that all portions of the equipment function properly and that the total performance criteria is satisfied.
 5. Make adjustments, replacements, or repairs necessary to achieve full operational capability and repeat tests until performance is achieved and approval obtained.
- B. Prior to acceptance, verify that all conditions specified in Article 3.02 A. have been satisfied and that equipment is ready for continuous use. Provide the following services preparatory to acceptance:
1. Clean or replace all filters and/or strainers.
 2. Adjust all belts and drive mechanisms.
 3. Lubricate all moving parts as required by manufacturer's operating instructions.
 4. Demonstrate to the Owner's representative and the Architect or Engineer the method and sequence of operation, and provide testing devices and/or data to verify that performance equals that specified.
 5. Provide three (3) set of operating instructions in bound form along with manufacturer's parts list and written warranties.

3.03 REPAIR AND TOUCHUP WORK:

- A. All damaged items shall be repaired and replaced as directed using proper materials and craftsmen skilled in that particular trade. Materials shall be as follows:
1. All repair or replacement parts shall be of the same quality and manufacture as the items being repaired.
 2. All touch-up paint shall be as provided by the item manufacturer for that purpose and shall exactly match the original color and finish.

3.04 EXTRA MAINTENANCE MATERIALS:

Carefully examine the requirements of the applicable Sections of all DIVISIONS and specifically of DIVISION 9 and deliver the materials required to the Owner.

3.05 RECORD DRAWINGS:

Various Sections of the detailed specifications require as-built drawings to be prepared by the Contractor(s). These drawings shall be collected by the Contractor, checked for conformance to the specific requirements, and when completed, delivered to the Architect. The Contractor shall also be responsible for collecting bound operating and maintenance manuals required of all trades supplying equipment, and for delivering them to the Architect.

3.06 FINAL INSPECTIONS:

- A. In addition to all items covered under those Sections of Divisions 2 through 16, inclusive, the Contractor shall comply with the requirements stated herein. When the Contractor request a final inspection, it shall be understood that the work has been carefully inspected by the Contractor to determine degree of completeness and compliance with all requirements set forth. Under no circumstances shall the Contractor ask the Architect or Engineer or his representative to make these determinations for him.
- B. The Architect or his representative will, when requested by the Contractor, make the final inspection, except under the following conditions:
 - 1. After inspecting one room or area and finding large quantities of work incomplete or not in compliance, the inspection shall cease, and the Architect will notify the Contractor of the broad area of work to be done.
 - 2. If the Contractor(s) have assured the Architect of the completeness and/or accuracy of the work and the inspection does not bear this contention out.
- C. To prevent the Architect or Engineer being required to act as a supervisory agent of the Contractor(s) by being asked to determine the degree of completion, the above conditions will be adhered to rigidly. If the Contractor(s) ask for additional inspections which are unwarranted, he shall reimburse the Architect at his Standard Hourly Rate for all time and expense incurred, by means of a back charge by the Owner to the Contractor. The Architect is herein defined as any of those firms or individuals listed by references on the drawings, including all consultants identified therein.
 - 1. Any inspection conducted by the Architect, his representative(s) or consultant(s) beyond an initial Punch List Inspection followed by a Final Inspection are considered to be Unwarranted Additional Inspections.

END OF SECTION

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Work included: Provide all material, labor, equipment and services necessary to maintain and revise all record documents and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-700	PROJECT CLOSEOUT
DIV. 15	GENERAL MECHANICAL PROVISIONS
DIV. 16	BASIC ELECTRICAL REQUIREMENTS

1.03 MAINTENANCE OF DOCUMENTS:

- A. Maintain at job site one copy of the following:
 - 1. Contract Drawings.
 - 2. Project Manual/Specifications.
 - 3. Addenda.
 - 4. Reviewed shop drawings.
 - 5. Change Orders.
 - 6. Construction Change Directives and other modifications to Contract.
 - 7. Field test records.
 - 8. Title 24, Parts 1, 2, 3, 4, 5, 9, 12
- B. Store Documents in field office apart from documents used for construction.
- C. Provide files and racks for storage of documents.
- D. File documents in accordance with Project Filing Format of Uniform Construction Index.
- E. Maintain documents in clean, dry, legible condition.
- F. Do not use record documents for construction purposes.
- G. Make documents available at all times for inspection by Architect, Owner and Owner's Inspector.

1.04 RECORDING:

- A. Provide red pencil for all marking of the blue line "Project Record" set.
- B. Label each document "Project Record" in 2 inch high printed letters.
- C. Keep record documents current.
 - 1. Project Record Set shall be kept current at all times. The Project Inspector will review the Project Record Set periodically for the Architect or Engineer at the time Payment Requests are processed. Should the Project Record Set not be current and up-to-date, the Architect reserves the right to hold the Payment Request until compliance with the Contract Documents has occurred.
- D. Do not permanently conceal any work until required information has been recorded.

- E. Legibly mark the “Project Record Set” Documents in the same quality as the Original Contract Drawings a record of actual construction for:
1. Elevation of finish grade for all points indicated on Site Grading Plan.
 2. Depths of various elements of foundation in relation to first floor finish elevation.
 3. horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 4. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 5. Field changes of dimension and detail.
 6. Changes made by Change Order, Field Order, **RFI’s or Construction Change Directives, Supplemental Instructions.**
 7. Details not on original Contract Drawings.
- F. Specifications and Addenda: Legibly mark up in the same quality as the Original Contract Drawings each section to record:
1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 2. Changes made by Change Order or Field Order **or any additional changes noted in Item E, #6.**
 3. Other matters not originally specified.
- G. Shop Drawings: Maintain like the Project Record Set documents and legibly mark up in the same quality as the Original Contract Drawings shop drawings to record changes made after review.
- H. Definitions:
1. **Project As-Built Documents**: A set of Contract Documents used for recording of actual construction information during the course of construction. The recording of construction information shall be kept on the Contract Drawings and Project Manual (which includes the Specifications). The construction information shall also include all Addenda, Change Orders and Modification Documents.
 - a. **Posting on the As-Built Documents**: Drawings, Addenda, Change Orders and Modification Documents which includes Supplemental Instructions, Request for Information, Construction Change Directives, etc.). They shall be neatly and clearly drafted, in a readable manor, in the same quality as the Original Contract Documents and capable of being reproduced or photocopied.
 - b. **The Posting of said items shall be posted to the back side of the corresponding drawing and or sheet. The said posting shall not be reduced no more than half its original size. An additional sheet may be required for postings if the “Changes or Clarifications” do not fit on the back side of corresponding drawing.**

1.05 SUBMITTAL:

- A. Prior to final Application of Payment, submit to the Architect the completed Project **Record Set (As-Builts), completed Specifications and Addenda sets, Submittals, Maintenance & Operation Documents, Warranty Documents.**

Provide (1) hardcopy set of the above and a digital set on (2) Compact Disks (CD).

- B. Accompany submittal with transmittal letter, in duplicate, containing:
1. Date.
 2. Project title and number.
 3. Contractor's name and address.
 4. Title and number of each record document.
 5. Certification that each document as submitted is complete and accurate.
 6. Signature of Contractor.

PART 2 - PRODUCTS

As described in Part 1.

PART 3 - EXECUTION

As described in Part 1.

END OF SECTION

WARRANTIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Contractor shall warranty that the Work done under this Project Manual will be free from faulty materials or workmanship and hereby agrees, upon receiving notification from the Owner or his Agent, to immediately remedy, repair or replace, without cost to the Owners and to his entire satisfaction, all defects, damages or imperfections appearing in said work within a period of one (1) year unless specified otherwise, after date of final acceptance by the Owner of all work done under this Project Manual, regardless of whether or not the Owner or persons operating under contract with the Owner partially or wholly occupies any portion of the work prior to acceptance.
- B. Warranties shall be in the form outlined below and shall be submitted in duplicate by the Contractor and submitted on his own letterhead.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

GENERAL CONDITIONS
SUPPLEMENTAL GENERAL CONDITIONS

1.03 WARRANTY FORM:

WARRANTY FOR _____

We hereby warranty and the General Contractor warranties that _____

has been done in accordance with the Drawings and the Specifications and that the Work as installed will fulfill the requirements of the warranty included in the Project Manual. We agree to repair, replace any or all of our work together with any other adjacent work which may be displaced or damaged by so doing that may prove to be defective in its workmanship or materials within a period of _____ years from date of acceptance of the above-named without any expense to the Owner, ordinary wear and tear and unusual abuse or neglect excepted. In the event of our failure to comply with above-mentioned conditions within ten (10) days after being notified in writing by the Owner or his agent, we collectively or separately, do hereby notified in writing by the Owner or his agent, we collectively or separately, do hereby authorize the Owner to proceed to have said defect repaired and made good at our expense and we will honor and pay the costs and charges therefore upon demand.

(Signature of Subcontractor)

(Signature of Contractor)

Date

1.04 SUBMITTALS:

- A. Submit 2 copies of all manufacturer's or installer/applicator's warranties and bonds as specified within Division 2-16.
- B. Submit to Architect together with Project Record Documents.
- C. Accompany submittals with transmittal letter in duplicate.
- D. When Product Submittals are required, submit copy of warranty with product submittal.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

WARRANTIES SCHEDULE:

Unless Otherwise Noted on Specific Spec. Section

<u>SPECIFICATIONS</u> <u>DIVISION AND ITEM</u>	<u>PERIOD</u>
Division 2 Asphaltic Concrete Paving.....	1 Year
Division 6 Modular Casework.....	2 Years
Division 7 All Roof Coverings.....	5 Years
All Sheet Metal, in connection with roof coverings.....	5 Years
All Joint Sealants.....	2 Years
Roof Accessories.....	2 Years
Division 9 Acoustic Ceilings.....	2 Years
Carpeting.....	2 Years
Division 10 Porcelain enamel Chalkboard Surfaces.....	Lifetime
Division 15 Plumbing.....	1 Year
HVAC Systems.....	1 Year
Temperature Controls for HVAC Systems.....	1 Year
Division 16 All Electrical Work.....	1 Year

END OF SECTION

CLEARING AND DEMOLITION

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to do all Clearing and Demolition and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-010	SUMMARY OF WORK
01-500	CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
02-200	EARTHWORK

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS

1.04 EXAMINATION OF SITE:

- A. Examine site and compare it with the Drawings and Specifications.
- B. Thoroughly investigate and verify conditions under which the work is to be performed.
- C. No allowance for extra work resulting from negligence or failure to meet requirements of Paragraphs 02-100/1.04 A and B.

PART 2 - PRODUCTS

(NOT APPLICABLE)

PART 3 - EXECUTION

3.01 REMOVAL OF TREES AND SHRUBS:

- A. Refer to Drawings for trees and shrubs to be removed under this contract.
 - 1. Remove tops, trucks and roots of trees, and shrubs to a minimum depth of 3 feet or to depth required to remove all roots 1-1/2" Diameter or larger.
 - 2. Review status of trees and shrubs with Architect. Owner may wish to relocate some of the trees and shrubs.

3.02 CLEARING:

Remove all loose soils which contain:

- A. Grass, weeds, and natural vegetation to a minimum depth of 12 inches.
- B. Trees, shrubs, stumps and roots except those indicated on the Drawings to remain.

3.03 DEMOLITION:

- A. Demolish and Remove All:
 - 1. Existing irrigation risers, valves, stand pipes, wells, pumps, power poles and electrical service.

3.04 DISPOSAL:

- A. All debris resulting from clearing.
- B. All debris resulting from demolition.
- C. All debris resulting from construction.

3.05 RELOCATION:

Relocate all existing utility lines where indicated on the Drawings to be relocated.

END OF SECTION

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 DESCRIPTION:

Provide all materials, equipment, transportation, and services necessary to complete Selective Demolition for the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-700 PROJECT CLOSEOUT

1.03 STANDARDS:

In accordance with 01-080 Codes and Standards.

1.04 JOB CONDITIONS:

A. Existing Conditions:

Field Conditions: Report any significant differences between field conditions and Drawings to Architect. It shall be incumbent on all bidders to visit the site and make themselves aware of any and all existing conditions that may effect the execution of the Work under this section.

B. Protection:

1. Barricades: See Section 01-500 for required barricades.
2. Shoring: See Section 01-500 Construction Aids.
3. Structure and Property: Take any and all steps necessary to protect all adjacent structures, and off site improvements and all elements of existing buildings to remain from damage during the progress of this work. Any and all damage inflicted on public and private property and the property of the Owner shall be repaired or restored to the original condition prior to the start of this Work. All repair work shall be done at no additional cost to the Owner.

PART 2 - PRODUCTS - (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 INSPECTION:

A. Prior to commencing of Selective Demolition, inspect the existing conditions and verify the conditions of existing elements to remain.

B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been resolved. Commencement of Selective Demolition shall constitute acceptance of existing conditions.

3.02 COORDINATION:

- A. Coordinate demolition with related items specified under other Sections to ensure proper and adequate interface of Work.
- B. Coordinate any utility shut-down with the Owner 48 hours in advance of the anticipated shut-down. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by the Owner. Provide temporary services during interruptions to existing facilities, as may be required by the Owner to maintain essential services.

3.03 PREPARATION:

- A. Obtain all necessary permits and authorization by regulatory agencies required to perform the Work under this Section.

3.04 PERFORMANCE:

- A. General:
 - 1. Selective demolition shall include the removal of all components of the existing building described in the Documents to be removed. Unless otherwise specified, the component identified for removal shall include all materials, accessories and fabrications associated with that component.
 - 2. All work shall be performed in a safe and orderly fashion.
 - 3. All salvageable assemblies, materials, and equipment that are shown or specified to be removed and are not shown or specified to be salvaged for future use by the Owner, shall become the property of the Contractor and shall be promptly removed from the building site. Refer to the plans for salvageable items that the Owner wants to retain in useable condition and delivered to District Maintenance Yard.

3.05 SELECTIVE DEMOLITION SCHEDULE:

- A. General: Items listed are for convenience only and not intended to cover full extent of work required.
- B. Schedule:
 - 1. Remove materials that are shown to be re-used.
 - 2. Remove, alter, or reconstruct all existing site elements as required for new construction.

END OF SECTION

EARTHWORK

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment, and services necessary to do all Earthwork and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-030	FIELD ENGINEERING
01-410	TESTING LABORATORY SERVICES
01-500	TEMPORARY FACILITIES
02-100	CLEARING AND DEMOLITION
02-280	SOIL TREATMENT
03-100	CONCRETE FORMWORK
DIV. 21, 22, 23	MECHANICAL (Excavating and Backfilling Utility Lines)
DIV. 26, 27, 28	ELECTRICAL (Excavating and Backfilling Utility Lines)

1.03 STANDARDS:

In accordance with Section 01-080 CODES AND STANDARDS and the following:

EPA	Environmental Protection Agency
CF	City of Fresno, Codes and Ordinances

GEOTECHNICAL INVESTIGATION AND GEOLOGIC-SEISMIC HAZARDS EVALUATION REPORT
TECHNICON ENGINEERING SERVICES, INC.
TES No. 230566.001
November 13, 2023

1.04 QUALITY ASSURANCE:

- A. In accordance with Section 01-410, Testing Laboratory Services.
- B. The Contractor shall confirm with the local utility companies “USA Service” regarding locations of all utilities prior to any excavation.

1.05 SUBMITTALS:

- A. Samples: In accordance with Section 01-300 Product Submittals, including import fill material and source.
- B. Project Closeout: In accordance with Section 01-700 Project Closeout Drawings including extent of engineered pads.

1.06 PROJECT CONDITIONS:

- A. Existing Conditions:
 - 1. Examine sites and verify conditions with the Drawings and Specifications.
 - 2. Thoroughly investigate and verify conditions under which the Work is to be performed.
 - 3. No allowance for extra Work will be granted resulting from negligence or failure to meet requirement of Article 02-200/1.06, A

- B. Environmental Requirements:
 - 1. Do not place fill during weather conditions which will alter moisture content of fill materials sufficiently to make compaction to the specified densities difficult or impossible.
 - 2. Perform Work in a manner as to minimize the spread of dust and flying particles. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, existing facilities, and concurrent performance of other on-site work.
 - 3. In accordance with EPA and CF.

- C. Protection:
 - 1. Protect fill area to prevent water running into excavation. Maintain area free of water. Remove seeping water immediately by pumps.

PART 2 - PRODUCTS

2.01 EARTH FILL:

- A. Approved, predominantly granular material composed of a reasonably well graded mixture of hard inert mineral fragments.

- B. Free of brush, roots, sod, rubbish, or other organic material or clay.

- C. Free of rocks 3 inches or larger in greatest dimension. Not more than 15 percent larger than 2-1/2 inches. Remove rocks or stones which may interfere with the action of compacting equipment.

2.02 ENGINEERED FILL:

- A. In accordance with Article 02-200/2.01 Earth Fill.

- B. Consistency of fill material:
 - 1. Maximum Plasticity Index.....15
 - 2. Maximum Particle Size.....3"
 - 3. Minimum Percent Passing #200 Sieve.....8-40
 - 4. Minimum R-Value.....30
 - 5. Maximum Expansion Pressure, psf.....0
 - 6. Minimum Percent Passing 1" Sieve..... 90
 - 7. Maximum Percent Liquid Limit.....30

- C. Excavated materials from site may be used subject to approval by the soils engineer.

- D. Import Fill shall be evaluated for acceptance by Testing Lab Soils Engineer in compliance with Geotechnical Investigative Report per Section 6.3 Fill Material.

2.03 TOP SOIL FILL:

Fertile garden loam, free of noxious weed seeds and root rhizomes, subject to approval of the Architect.

2.04 FINISH FILL:

Acceptable topsoil shall be excavated material from the top 15 inches of site which is free of roots and other organic material, and rocks larger than 2 inches. Fill material shall be subject to Architect's approval.

2.05 BACKFILL:

In accordance with Article 02-200/2.01 Earth Fill.

2.06 SAND FILL:

- A. Sand to be washed and of natural siliceous or igneous origin, having hard, strong and durable particles.
- B. Sand to contain no more than 5 percent of foreign substances such as clay lumps, loam, silt or other deleterious material.
- C. Sand requirements:
 - 1. Percent passing 1 inch sieve.....100%
 - 2. Percent passing 3/4 inch sieve.....85-100%
 - 3. Percent passing #4 sieve.....0-40%
 - 4. Percent passing #200 sieve.....0-3%

2.07 VAPOR RETARDER:

- A. Stegowrap 15 mil minimum thickness, resistant to deterioration when tested in accordance with ASTM E 154. Install per manufacturer instructions.

PART 3 - EXECUTION

3.01 LAYOUT OF WORK:

- A. Contractor shall be responsible for all lines and grades.
- B. Check all bench marks, monuments, and property lines, and verify locations.
- C. Locate and maintain all grade stakes.
- D. Monuments moved or displaced during grading operation are to be replaced by a qualified surveyor at Contractor's expense.

3.02 CLEARING SITE:

- A. The Contractor shall protect certain trees as indicated on the drawings and remove other trees, stumps, shrubs, grass, debris, concrete and asphaltic concrete walks, and paving to the extent indicated on the drawings; and any other obstruction on the site before proceeding with the work. Unless otherwise indicated, all such items shall be disposed of by the Contractor away from the premises.
- B. Prior to starting work, the Contractor shall notify the Architect of his intent to commence work. Hose bibbs, utility lines etc. to be abandoned within the construction area shall be removed by the Contractor and stubbed off outside of the limits of construction.
- C. If, during excavation and grading for ramp foundations and sidewalks at the sites, utility lines are uncovered (water, electric, sewer, etc.) not shown on the drawings, work must stop and Owner notified promptly for his review and action.

3.03 PREPARATION OF SITE:

- A. General: Excavate building, concrete walk, and paved area of all loose material and to a minimum of **12"** inches below bottom of footing, or 18" below site grade.
- B. At Engineered Fill: Excavate to a depth indicated on the drawings, but not less than 18 inches below existing grade.
- C. Where trees, bushes, underground tanks, or foundations of old buildings have been removed, remove loosened soils to a depth sufficient to expose a compact and stable surface to receive fill. Recompact depressions with approved on-site soils in lifts not exceeding **6** inches to a density of not less than **92** percent in accordance with ASTM D 1557.
- D. Stockpile suitable excavated material. Remove unsuitable excavated material from site.
- E. Scarify exposed subgrade and all areas to receive fill to depth of **12** inches.
- F. Recompact native soil subgrade to a density of not less than **90** percent in accordance with ASTM D 1557.

3.04 PLACING OF EARTH FILL:

- A. Spread Earth Fill in successive loose layers that are maximum eight (8) inches thick, maximum to plus or minus **0.05** feet of sub-grade.
- B. Moisten or dry Earth Fill to obtain optimum moisture content for compaction. Add water as required to obtain uniform distribution of water to each layer. Disc soil to thoroughly mix after water is added.
- C. Compact Earth Fill at buildings to a density of not less than **90** percent in accordance with Test Designation, ASTM D1557-78.
 - 1. **95** percent compaction at paving, parking and driveway areas within the upper **12** inches of subgrade soil.
- D. Compaction by ponding or jetting shall not be permitted.

- E. Contractor shall be responsible for selection of equipment used for compaction, and for obtaining specified fill density.

3.05 PLACING ENGINEERED FILL:

- A. Place Engineered Fill in accordance with Article 02-200/3.04.
- B. Extent: Refer to Drawings.
- C. Preparation of Sub-grade and selection and placing of Engineered Fill subject to continuous inspection and supervision of Soils Engineer selected by the Architect.
- D. Density of each layer of Engineered Fill shall be tested and verified that it meets required density of Soils Engineer prior to placing succeeding layer.
- E. Conduct Work to minimize inspection costs.
- F. Costs of inspection by Owner.

3.06 EXCAVATION FOR FORMWORK:

- A. Excavate for footings to depth and width indicated on Drawings or within these specifications.
- B. Protect top corners of trenches against sloughing. Refer to Structural Drawings for details.
- C. Omit side forms at footings if excavation stand without caving. Make footing trench 2 inches wider than width of concrete footing indicated on Drawings, when earth is used as a form. Cut trenches true and straight. Make side cuts neat and plumb. Bottom of trenches shall be level with reasonably sharp corners.
- D. When forms are required at footing, allow additional space for construction and inspection.
- E. Provide means to accurately position and secure sill bolts, tie downs, reinforcing, and all other inserts in concrete.
- F. Footings to bear on firm soil.
- G. Notify Architect if unsuitable bearing is encountered at depths indicated. After review and approval of the Architect, continue excavation.
- H. Fill trenches excavated below indicated depths on Drawings with concrete to required elevations. Concrete in accordance with Section 03-300 Cast-in-Place Concrete.

3.07 TRENCHING FOR PIPING OR CONDUIT:

- A. Cut trenches true and straight. Make sides with neat cut. Bottom of trenches shall be uniform and in conformance with lay of piping.
- B. Cut trenches wide enough to provide sufficient working space.
- C. Piping or conduit to bear on firm soil. Notify Architect if unsuitable bearing is encountered at depths indicated.
 - 1. Depth for Subbase Support: Where installation of subbase material is indicated, excavate for installation of subbase material in depth indicated or, if not otherwise indicated, **6** inches below bottom of work to be supported.
- D. Fill trenches excavated below required depths to required depth with sand fill.
- E. Hand excavate below belling so that piping bears continuously on firm soil.

3.08 PROTECTION OF EXCAVATIONS:

- A. Provide all shoring and bracing required.
- B. Prevent water, caving, or sloughing from entering excavation.
- C. Maintain excavations free of water.

3.09 PLACING BACKFILL:

- A. Place Backfill in accordance with Paragraph 02-200/3.04 Placing Earth Fill.
- B. Remove all debris, wood, paper and deleterious materials from excavations before backfilling.
- C. Do not backfill against foundation wall without Architect's approval and not until forms have been removed. Place backfill on each side simultaneously or brace one side.
- D. Do not backfill over piping until piping has been tested, inspected and approval.
- E. Fill excavation with earth fill spread in successive layers that will result in compacted layers no greater than **8** inches thick. Compact around the lower haunches of piping without disturbing the pipe's line and grade.
- F. Compact fill to **92** percent to **12** inches above pipe or to **24** inches of required grade, whichever is greater. Compact remainder of fill to **92** percent per soil report minimum or as required by surface construction.

3.10 FILL UNDER INTERIOR SLABS:

- A. Roll Engineered Fill to smooth surface, free of large or sharp particles. Wet the subgrade until a moisture equilibrium state is reached.

- B. Vapor Retarder Application:
 - 1. Use maximum width and length allowing ease of handling. Lap sheets 12 inches minimum. Seal all joints with pressure sensitive tape.
 - 2. Install collar at all columns, pipes or ducts penetrating vapor barrier fastened to vertical and lapped horizontally minimum of 12 inches.
- C. Roll sand fill to a smooth surface; see Part 2.16 of Cast-In-Place Concrete Specification section.

3.11 FILL UNDER EXTERIOR SLABS:

Place Earth Fill in accordance with Paragraph 02-200/3.04, Placing Earth Fill.

3.12 EXTERIOR ROUGH GRADING AND FILL:

- A. Remove debris subject to termite attack, rot, or corrosion; and all other deleterious material from areas to receive rough grading.
- B. Rough Grading:
 - 1. All areas within the Project.
 - 2. Excavate to elevations indicated on Drawings. At all planting and turfed areas where finish grade is more than 15 inches below natural grade, undercut 6 inches and fill to finish grade with Finish Fill.
 - 3. Fill all excavated areas resulting from removal of all foundations, abandoned utilities, demolition and removal of trees and shrubs.
 - 4. Rough grading shall be reasonably smooth, compacted and free from irregular surface changes.
 - 5. Finish ditches, swales and gutters to drain readily.
 - 6. Slope subgrade evenly from building in all directions to provide drainage. Minimum slope 1/4 inch per foot.
 - 7. Protect newly graded areas. Repair impairments resulting to grading from settlement or washing and re-establish grades to the required elevations and slopes.
- C. Place Earth Fill as specified in Paragraph 02-200/3.04 Placing Earth Fill.

3.13 FINISH GRADING:

- A. Place Finish Fill in maximum loose layers of **8** inches and compact.
- B. Finish grade elevations outside of buildings shall comply with elevations indicated on Drawings.
- C. Minimum depth of compacted Finish Fill to be **8** inches.
- D. Elevations and extent of finish grading is indicated on Drawings and shall provide drainage away from building.
- E. Keep elevations of areas to be turf one inch below adjoining walks, curbs, slabs, etc.

3.14 FILL IN PLANTERS:

- A. Material - Finish Fill.
- B. Depth - As indicated on Drawings, **12** inch minimum.
- C. Finish Grade - Within **2** inches of adjacent curb or walk.

END OF SECTION

SOIL TREATMENT

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to provide Termite Control and Soil Sterilization, and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
02-200	EARTHWORK
03-300	CAST-IN-PLACE CONCRETE

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

USDA	United States Department of Agriculture
EPA	Environmental Protection Agency

All Applicable Environmental Protection Regulations and Standards

1.04 QUALITY ASSURANCE:

- A. All soil poisoning shall be done by licensed operator.
- B. All products will comply with the current EPA laws at the time of application. Should the products listed become unavailable because of changes in the law, submit substitute products in accordance with Section 01-640 for review by the Architect.

PART 2 - PRODUCTS

2.01 TERMITE CONTROL:

“Demon MAX” Solution: Two (2) gallon “Demon TC” in Ninety-Nine (99) gallons of water for a 0.50% emulsion solution. “Demon MAX” as manufactured by Syngenta Crop Protection, or approved equivalent.

2.02 SOIL STERILIZATION:

Monobor-Chlorate Solution; Two (2) pounds Monobor-Chlorate Granular in one (1) gallon water, or approved equivalent.

PART 3 - EXECUTION

3.01 TERMITE CONTROL

- A. Meet all requirements of USDA.
- B. Extend and rate of application. In accordance with manufacturer’s label recommendations and the applicable laws where the project is located, and the following:

1. Soil along both sides of foundation walls, interior foundation wall, around plumbing, piers and conduits.
 - a. Dig a narrow trench, not wider than 6 inches, or rod to a depth of 4 feet, but not below the top of the footing. Apply 4 gallon of 0.50% emulsion per 10 linear feet of trench per foot of depth from grade to top of footing.
2. Soil under all interior finished concrete slabs.
 - a. Spray 1 gallon of 0.50% emulsion per 10 square feet.
 - b. **NOTE:** If concrete slabs cannot be poured over soil treated the same day, a waterproof cover (such as polyethylene sheeting) should be placed over the treated soil.
3. Soil under all exterior finished concrete slabs or paving abutting the buildings within 10 linear feet of the exterior foundation walls.
 - a. Spray 1 gallon of .50% emulsion per 10 square feet of gravel or dirt fill that will be beneath slabs. if fill is washed gravel or other course material, use 1-1/2 gallons per 10 square feet.
 - b. **NOTE:** If concrete slab cannot be poured over soil treated the same day, a waterproof cover (such as polyethylene sheeting) should be placed over the treated soil.

3.02 SOIL STERILIZATION:

- A. Extent of Application: Soil under all asphaltic concrete paving, including driveways, parking areas, and athletic courts.
- B. Application:
 1. Thoroughly water soak sub-base with water truck. Avoid excessive water runoff.
 2. Apply Monobar-Chlorate Solution over sub-base prior to application of asphaltic concrete.
 3. Apply in spray form.
 4. Rate of Application: 2 gallons of solution to each 100 square feet.
 5. Take all precautions to limit soil sterilization to areas immediately under paved areas.

END OF SECTION

DRAINAGE SYSTEM (APPLICABLE @ EXISTING SCHOOL SITES)

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment, and services necessary to furnish and install revisions and extensions to existing Drainage Systems, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically included.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
02-200	EARTHWORK
02-280	SOIL POISONING
02-513	ASPHALT CONCRETE PAVING
03-300	CAST-IN-PLACE CONCRETE
DIV.15	PLUMBING

1.03 WORK FURNISHED BY OWNER:

NOT APPLICABLE

1.04 STANDARDS

In accordance with 01-080 CODES AND STANDARDS and the following:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AWS	American Welding Society
FMFCD-SS	Fresno Metropolitan Flood Control District - "Standard Specifications."
SS-CDOT	"Standard Specifications" State of California, Department of Transportation (Caltrans).

1.05 SUBMITALS:

- A. Product Data: In accordance with Section 01-300 Product Submittals.
- B. Shop Drawings: In accordance with Section 01-300 Product Submittals.
- C. Project Record Documents: In accordance with Section 01-720 Project Record Documents.

PART 2-PRODUCTS

2.01 MATERIALS:

- A. Catch Basins for Pipes: 18 inches and smaller: Unless otherwise noted. V12 and U23 Catch Basin complete with HD cast iron grate manufactured by CHRISTY CONCRETE PRODUCTS, INC., or approved equivalent.

- B. Storm Drains 10 inches or less in diameter shall be constructed of Class 150 Poly-Vinyl Chloride (PVC) pressure pipe and fittings in conformance with AWWA C-900.
- C. Precast drainage inlets and drainage junction boxes shall be precast concrete structures of the type specified on the drawings. All such precast drainage boxes shall be installed, complete with accessories specified in conformance with all of the manufacturer's recommendations and as specified on the drawings.
- D. Concrete for inlets and other structures shall meet the requirements of Section 90 of the State Standard Specifications, and shall be Class A unless otherwise indicated on the drawings. The allowance for slump shall be no more than 3 inches.
- E. Cement mortar for use in structure patching shall be composed of one part portland cement and two parts of clean, well-graded sand of such size that it will pass a No. 8 sieve. An admixture of hydrated lime, fire clay or diatomaceous earth may be used in the mortar to facilitate workability, and the amount of such material used will be limited as ordered by the Engineer. Quick setting cement may be used when the Engineer determines that conditions so warrant. No mortar shall be used in which water has been added to the dry ingredients for a period of over 30 minutes.

2.02 BACKFILL:

In accordance with Section 02-200 EARTHWORK.

2.03 PVC PIPE SLEEVES:

- A. PVC pipe shall be Class 40 solvent weld or Class 200 "o" ring PVC 1120 high impact pipe. Pipe shall be of improved white rigid polyvinyl chloride compound conforming to current National Sanitation Foundation (NSF), Iron Pipe Size (IPS) Standards and the American Society for Testing and Materials (ASTM D 1785-83 and ASTM D 2241-83).
 - 1. Fittings shall be white rigid polyvinyl chloride (PVC) combination Type I and Type II grade, I standard weight schedule 40 (ASTM D 2466-78 and ASTM D 2464-76). Rubber gasketed fittings may be used and shall match the pressure rating or schedule of pipe used. Pipe shall be pressure tested to 125 psi for duration of 2 hours and proved water tight prior to paving operations. Install 4 inch diameter and larger pipe 24 inches below grade and under 4 inch diameter pipe 18 inches below grade. All pipes must have horizontal separation.

PART 3 - EXECUTION

3.01 EXCAVATION OF TRENCHES:

- A. Alignment and grade shall be true to points set by the Registered Civil Engineer employed by the Contractor for layout of work.
- B. The grade lines shown on the Drawings indicate flow line or invert of pipe and all cuts, unless otherwise indicated, refer to this line.
- C. In accordance with Section 02-200 EARTHWORK.

3.02 STORM DRAIN PIPE INSTALLATION:

- A. Construction of all storm drain pipelines shall proceed upstream with the spigot end of the pipe in the direction of flow, unless otherwise approved in writing by the Architect.
- B. All storm drain pipe shall be laid and jointed in compliance with the manufacturer's recommendation and shall be carefully adjusted to grade by scraping away or filling and tamping the trench bottom. Use of blocks to support the pipe is prohibited. Each joint of pipe must be fully pressed into place so that there will be no unevenness or settlement of one length of pipe with the other at the joint.
- C. The open ends of all lines being installed must be covered to keep out animal life, etc. whenever the line is left unattended for any length of time, such as overnight.
- D. The ends of all pipe sections shall be of such design that when properly laid they shall have a smooth surface and uniform interior surface. Both ends of pipe sections shall be substantially free of cracks and broken edges. Pipe so found to be damaged shall be rejected for use in work.
- E. For PVC pipe, sealing of joints shall be accomplished with a coupling designed to maintain alignment and ensure tight, flexible joints. Couplings shall be of plastic sleeve type or of the rubber gasket type. The ends of the pipe shall be thoroughly cleaned immediately prior to joining sections of pipe and installation of the coupling. The two sections joined shall be firmly placed together in such a manner that each succeeding section of pipe is forced "home" as far as possible into the coupling. No appreciable gap shall exist at the completed joint, except as permitted by the Architect at locations where curves in the pipe alignment are specified or required. Excessive gaps in any case shall be cause for rejection of the work, and corrective measures shall be taken when ordered by the Architect.

3.03 INLETS, OUTLETS AND OTHER DRAINAGE STRUCTURES:

- A. Storm drainage structures such as inlets, and other miscellaneous drainage structures shall be furnished and installed by the Contractor as indicated on the plans and specifications as directed by the Architect.
- B. Lateral pipes connecting to storm drain inlets and outlets shall be installed flush with the inside walls of the structure, except that pipe edges shall be smoothed and rounded with cement mortar to a 3 inch radius.
- C. Grading work in the immediate vicinity of any installed inlet structures shall be done by the Contractor as directed by Architect so as to provide for the movement of surface water to the newly installed inlet. Full compensation for said grading work shall be included in the bid price for inlet structures, and no separate payment will be made therefore .
 - 1. Set in locations and elevations as indicated on the drawings.
 - 2. Elevations Tolerances: Plus or minus 1/4 inch.

3.04 INSTALLATION OF BACKFILL:

- A. In accordance with Section 02-200 EARTHWORK.

END OF SECTION

LANDSCAPE IRRIGATION SYSTEM

PART 1-GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment, accessories and other related items and services necessary to restore the “schools” Landscape Irrigation System at the improvements area; as necessary to provide an operating system to match the campus existing system to accommodate Project Site Improvements. The Contractor shall field verify the extent of the existing landscape irrigation system.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
02-200	EARTHWORK
03-300	CAST-IN-PLACE CONCRETE
DIV.15	PLUMBING
DIV.16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS.

1.04 WARRANTY:

- A. Irrigation system shall be warranted for one year from date of completion in accordance with Section 01-740, WARRANTIES.

1.05 OPERATIONS AND MAINTENANCE INSTRUCTIONS:

- A. Two copies of all equipment operations, maintenance instructions and all wire diagrams shall be furnished to the Owner prior to final acceptance.

1.06 SUBMITTALS:

- A. Contractor shall submit four copies of complete lists of proposed materials to Architect, including manufacturer’s name and catalog numbers.
- B. Shop drawings shall follow for all equipment with characteristics as listed in product specifications. Materials and equipment shall not be ordered until given written approval by Architect.

1.07 DEFINITIONS:

- A. Piping: All pipe fitting, valves, and accessories as required for a complete piping 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

PART 2-PRODUCTS

2.01 PIPING MATERIALS:

- A. Piping:
1. Pressure pipe/upstream of control valve:
 - a. Four inch and smaller: PVC Class 315 (ASTM D 2241).
 2. Circuit pipe/downstream of control valve:
 - a. PVC Class 200 (ASTM D 2241).
 3. Fittings:
 - a. For PVC plastic pipe: PVC Schedule 40 socket fittings (ASTM A 2564), Type 1, Grade 1.
 - b. For connections between main lines and RC valves: Schedule 80 PVC (threadhold both ends).
 4. Risers to irrigation heads: Galvanized steel, PVC Schedule 80, or I.P.S. Flex Hose.
 5. Solvent Weld Adhesive: WELD-ON No. 705 for rigid PVC pipe, with primer.
- B. Valves: Match Existing

2.02 CONTROLLER:

Not Applicable

2.03 SPRINKLER HEADS:

Match Existing

2.04 BACKFLOW PREVENTER:

Not Applicable

2.05 QUICK COUPLING VALVE:

Match Existing

2.06 OTHER MATERIALS:

- A. Materials not specifically indicated but necessary for proper execution of this work shall be of the first quality as selected by the Contractor subject to the acceptance of Architect.
- B. All materials appearing in the legend and details of the irrigation drawings are part of this job. Contractor is responsible for installation according to drawings and details. The system shall efficiently and uniformly irrigate all areas and perform as required by these plans and specifications.

PART 3-EXECUTION

3.01 SYSTEM DESIGN:

- A. Submit Shop Drawings of Irrigation system modification proposed showing existing system and modifications; for review modify and approval. The Contractor shall modify irrigation system as directed by the Owner.
- B. Verify the on site pressure provided at P.O.C. prior to system modification and installation and report any system operating discrepancies in writing to the Architect. Failure to inform the Architect of any discrepancy in design pressure seven working days prior to installation of the irrigation system shall institute responsibility of corrective action to Contractor, at no expense to the Owner.

3.02 PIPING INSTALLATION:

- A. General: Support piping without strain on joints or fittings and allow for piping expansion and contraction. "Snake" pipe into trench in accordance with manufacturer's recommendations to allow for expansion. Lay on solid sub-based, uniformly sloped.
- B. Joints:
 - 1. PVC Solvent Weld: Pipe shall be cut square and reamed to full size. Check for assembly prior to solvent weld. Remove excess solvent. All assembly shall be in accordance with manufacturer's recommendations, including use of primer on 1/2" pipe or larger.
 - 2. Steel or PVC Schedule 40 Threaded: Pipe shall be cut square and reamed to full size. Threads shall be full cut, true and tapered. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only.
 - 3. Open Ends: Open ends of piping shall be capped during progress to preclude foreign matter. All pipe shall be assembled free from dirt and pipe scale.
- C. Place concrete thrust blocks at all turns in mainline. Do not enclose entire joint with concrete.

3.03 SPRINKLER HEAD AND INSTALLATION:

- A. 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 heads.

3.04 PIPE DEPTH AND BACKFILL:

- A. Piping Upstream of Control Valves: Minimum cover shall be 24". Backfill shall be in 6" increments. Each increment shall be compacted to 90% with tampering machine. Level to finish grade.
- B. Piping Downstream of Controls Valves: Minimum cover shall be 12". Backfill shall be in 6" increments compacted to 80%. Level to finish grade.

3.05 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 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 contractor 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 ant new section must be included in test.

- B. Piping Upstream of Control Valves: Main 100 psi water pressure for a duration of (4) hours. There shall be no drop in pressure during test except that due to ambient temperature changes.

- C. Adjustments: Irrigation system shall be maintained and adjusted as required to provide proper coverage throughout the maintenance period. Maintenance shall be continued until final acceptance.

END OF SECTION

CHAIN LINK FENCING

PART 1 - GENERAL

1.01 SCOPE:

Provide all material labor, equipment and services necessary to furnish and install Chain Link Fence, accessories and other related items as indicated on the drawings and as specified.

1.02 STANDARDS:

In accordance with Section 01-080 Codes and Standards and the following:

CLFMI Chain Link Fence Manufacturer's Institute
Accessible gates shall comply with 2022 CBC, Section 11B-404.

PART 2 - PRODUCTS

2.01 FABRIC:

- A. **Material:** Nine (9) gauge copper bearing steel wire.
- B. **Design:** Continuous knuckle chain link with two (2) inch mesh.
Top and bottom edges shall have knuckle ends.
- C. Fabric shall conform to the specifications of ASTM Specification Designation A392, Class 1 Zinc Coating. Fabric shall be galvanized before weaving (GBW).

2.02 POSTS:

The base material used shall conform to the specifications of ASTM Specification Designation A120, Standard Weight, and all posts shall be round, seamless or continuously welded, steel pipe hot dipped galvanized (in accordance with ASTM Specification Designation A123) after fabrication, and sizes as herein specified unless detailed otherwise. All posts shall be fitted with rain-proof caps designed so as to fit securely over the top of the posts.

- 1. **Line Posts:** 2 3/8" outside diameter, 3.65 pounds per lineal foot.
- 2. **Corner and End Posts:** 4" outside diameter, 9.10 pounds per lineal foot.
- 3. **Gate Post:** Dome Top

<u>Single Gate Width</u>	<u>DbL. Gate Width</u>	<u>Size Nominal</u>	<u>Weight per</u>
		<u>Diameter</u>	<u>Lineal Foot</u>
to 6'	to 12'	4"	9.10 pounds
6' to 13'	12' to 26'	4"	10.79 pounds

2.03 RAILS:

The base material used shall conform to the specifications of ASTM Specification Designation A120, Standard Weight, and all rails shall be round steel pipe galvanized (in accordance with ASTM Specification Designation A123) after fabrication. 1/2" outside diameter, 2.72 pounds per lineal foot.

2.04 TENSION WIRE:

Seven (7) gauge (0.177" diameter), heavy galvanized, high carbon coil steel spring wire. Galvanization shall be in accordance with the provisions ASTM Specification Designation A116, Coating Class 3.

2.05 HOOK BOLTS:

3/8" x 6" galvanized steel with nut. Anchored in concrete at mid-point between all fence posts.

2.06 FABRIC TIES AND HOG RINGS:

Nine (9) gauge (0.148" diameter) galvanized steel wire. Galvanization shall be in accordance with the provisions ASTM Specification Designation A116, Coating Class 3.

2.07 STRETCHER BARS:

¼" x ¾" stock bar steel galvanized after fabrication. Galvanization shall be in accordance with the provisions ASTM Specification Designation A153.

2.08 TENSION BANDS:

7/8" x 3/32" minimum galvanized stock band steel.

2.09 TRUSS ROD ASSEMBLY:

3/8" round galvanized adjustable steel rod. The adjuster shall be provided with flat and lock washers and shall be "double-nutted", as directed by the Architect or Engineer, to lock the adjuster.

2.10 FITTINGS:

Malleable cast iron or pressed steel. Hot dip galvanized.

2.11 GATES:

A. Frame: 2" outside diameter, 2.72 pounds per lineal foot, heavy galvanized steel pipe conforming to ASTM Specification Designation A120.

B. Hardware: Corner fitting, ball and socket hinges, track and roller units, catches, stops, center rest and hold backs heavy galvanized malleable iron. Hinges 180 degrees. Panic hardware assembly at single gates. Drop lock assembly at double gates.

2.12 SLATS:

High density polyethylene (flat tubular shape) fence slats (width 1.062 x depth .312" x .020" thickness x length 4" less than fence height.) as manufactured by PDS Fence Products or equal. Provide with horizontal bottom channel slat locking system. Color(s) as selected by Architect from Manufacturer's standard color chart.

2.13 CONCRETE:

Material: 3000 psi in accordance with Division 03 Concrete and the drawings.

2.14 QUALITY ASSURANCE:

- A. All abraded and damaged galvanized surfaces or welded areas shall be regalvanized or may be cleaned and painted with two (2) coats of zinc oxide, zinc dust paint conforming to the requirements of Federal Specification MIL-P-15145, the paint to be properly compounded in a suitable vehicle in the ratio of one part zinc oxide to four parts zinc dust, by weight.
- B. The Architect or Engineer, at his option, may require the fence posts and rails to be tested. If so, one post from each lot of posts, and one rail from each lot of rails to be used in the work shall be tested in accordance with the requirements of ASTM Specification Designation A120. If that post or rail fails, two additional posts or rails from the same lots will be tested. If either of the two additional sampled posts or rails fails, the entire lot of posts will be rejected.

PART 3 - EXECUTION

3.01 LAYOUT:

Layout as indicated on the drawings. Lines straight and true. Line posts to be spaced 10 feet on centers maximum.

3.02 FOOTINGS:

12" diameter, 36" deep minimum. Pour concrete against undisturbed soil.

3.03 INSTALLATION OF RAILS:

- A. Install Top Rails continuous at top of fence set in line post top fittings. Supply in lengths approximately 20 feet long. Join pipes and attach to Corner and Gate Posts providing a continuous brace from end to end of each stretch of fence. Fittings to allow for expansion and contraction.
- B. Install Brace Rails between all Corner and Gate Posts and the first line Post. Securely attach to Post with Fittings. Truss brace Brace Rails with Truss Rod Assembly fastened to Line Post and bottom of Corner Post.

3.04 INSTALLATION OF TENSION WIRE:

- A. Furnish and be responsible for accurate placement of Hook Bolts for installation in concrete slab at mid-point between Line Posts.
- B. Stretch Tension Wire between all Corner and Line Posts. Securely fasten to all Posts.
- C. Hook Tension Wire through Hook Bolts.

3.05 INSTALLATION OF FABRIC:

- A. Attach Fabric to Corner, End, and Gate Posts with Stretcher Bar attached to Post with Tension Bands at 12" on center maximum.
- B. Attach Fabric to Line Post and Rails with Fabric Ties at 18" on center maximum.
- C. Attach Fabric to Tension Wire with Hog Rings at 18" on center maximum.

A.06 INSTALLATION OF GATES:

- A. Install Gates as indicated on the drawings complete with fabric, bracing and hardware.
- B. All bolted fixtures, including gate hinge attachments, turnbuckles, or other adjusters, clamps, or any device which is bolted, shall be provided with flat washers behind bolt heads, except where stove bolts are used; and flat and lock washers behind nuts. All turnbuckles or other adjusters shall be "double-nutted" to lock the adjuster.

3.07 Installation of Slats:

- A. Install slats per manufacturer's recommendation.
- B. Maintenance Material: Provide 20 L.F. of slats for each color selected, max. of 3 colors will be selected.

END OF SECTION

LANDSCAPING

PART 1-GENERAL

1.01 SCOPE:

- A. Provide all material, labor, equipment and services necessary to amend existing Landscaping as required due to Relocatable site improvements unless specifically excluded.
- B. The landscape work includes, but is not necessarily limited to the following:
 - 1. Fine grading, ripping of compacted soil and soil preparation
 - 2. Restore existing landscape (lawn and planters) to an acceptable condition as directed by the Architect. Bare soil will not be accepted, all areas affected by the Relocatable and related improvements shall be returned or replanted to a complete finish condition.
 - 3. Tree hole boring for trees.
 - 4. Thirty-day maintenance.
 - 5. Protection of existing trees.
- C. All other requirements appear in the following sections: Part 1, Part 2 and Part 3.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
02-200	EARTHWORK
02-441	LANDSCAPE IRRIGATION SYSTEM
03-300	CAST-IN-PLACE CONCRETE
DIV.15	PLUMBING
DIV.16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS.

1.04 DEFINITIONS:

- A. The term “approved” shall mean by the Architect, and only in writing.

1.05 PROJECT CONDITIONS:

- A. Existing Conditions:
 - 1. The Landscape Contractor is to visit the job site to verify existing conditions including soil, subsurface conditions, drainage, etc. making allowances in his bid.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Sod Turfgrass: District standard type.

PART 3 -EXECUTION

3.01 INSPECTION:

- A. Examine the area and conditions under which the work in this section is to be performed. Correct conditions detrimental to the timely and proper completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 FINE GRADING:

- A. Before commencement of any fine grading or planting, all existing grasses and weeds on the site shall be killed by application of ROUNDUP herbicide or approved equivalent. All dead vegetation shall be removed from site and disposed of in a lawful manner.
- B. For all planting areas: Prior to finish grading, six (6) cubic yards of humus and 200 lbs. ag gyp per 1,000 S.F. (1 ton per 10,000 S.F.) of soil area shall be incorporated into the soil to the depth of approximately six inches (6”).
- C. Rough grading and ripping shall be performed by the Landscape Contractor prior to finish grading. The Landscape Contractor shall perform such additional hand work as necessary to produce a proper base for the work of this section, including tilling and smooth grading.
- D. Finish Grading: Upon completion of soil preparation, grade all shrub and groundcover areas to smooth and even slope from the center of the planting areas toward adjacent walks and curbs: in planting areas adjacent to fencing, slope finish grades away from fence. Finish grades shall be one inch (1”) for lawn areas, and two inches (2”) for planter areas below all walks and curbs.

3.03 PLANTING:

- A. Planting Procedures:
 - 1. Planting shall be performed by workers familiar with planting procedures and under the supervision of a qualified foreman. The planting foreman shall be on the job site at all times when planting is in progress.
 - 2. Planting operations shall not occur under unfavorable weather conditions.
 - 3. Large trees shall be planted first, before groundcover is planted.
 - 4. Proceed and complete the landscape work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of landscape work required.
- B. Tree Staking:
 - 1. All trees shall be supported by two (2) tree stakes..
 - 2. Stake shall be set firmly in the ground on the northwest side of the plant, and southeast side where two stakes are required.
 - 3. Trees shall be tied to upright stakes loosely with WORLDWIDE TREE TIES (see planting detail), or approved equivalent.
- C. Lawn:
 - 1. **Sod Preparations:** Planting area shall be smooth with uniform texture, cleared of weeds and debris. One inch of lawn mulch shall be applied and tilled four inches into the topsoil. Apply a commercial fertilizer of formula 16-6-8 at 5 lbs. per 1,000 S.F. and decomposed wood fiber at a rate of 40 lbs. per 1,000 S.F.

2. **Returfing Preparations:** Planting area shall be smooth with uniform texture, cleared of weeds and debris. One inch of lawn mulch shall be applied and tilled four inches into the topsoil. Apply ½" of lawn mulch into the soil. Uniformly hydroseed with District type seed at a rate of 5 lbs. per 1,000 S.F.; the hydroseed mixture shall include a commercial fertilizer of formula 16-6-8 at 5 lbs. per 1,000 S.F. and decomposed wood fiber at a rate of 40 lbs. per 1,000 S.F.
3. **Sowing:** Seed mix shall be uniformly sown by hydroseeding at a rate of 5 lbs. per 1,000 S.F. The hydroseed mixture shall include a commercial fertilizer of the formula 16-6-8 at a rate of 5 lbs. per 1,000 S.F. and a decomposed wood fiber at a rate of 40 lbs. per 1,000 S.F.

3.04 MAINTENANCE:

- A. Damaged areas shall be restored to their original condition.
- B. Upon completion of project, all debris and waste material shall be removed from the site and the area cleaned up.
- C. Maintenance shall begin immediately after planting is complete and approved by the Architect (notice of start of Maintenance Period).
- D. Maintenance period shall be for a minimum of ninety (90) calendar days. All trees, shrubs and ground cover shall be kept at optimum growing condition by watering, weeding, replanting, fertilizing, cultivating, tree stake repair, spraying for disease and insects, replace dead or drying materials, pruning as directed, maintaining proper grades of plants, and providing any other reasonable operations of maintenance and protection required for successful completion of the project.
- E. All trees shall be guaranteed for one year and all ground covers for 120 days (4 months).

3.06 CLEAN-UP:

- A. All areas shall be maintained in a neat and orderly condition at all times.

3.07 FINAL INSPECTION AND ACCEPTANCE:

- A. At the time of inspection, Contractor shall have all planted and ground cover areas free of weeds and neatly cultivated and topdress with mulch. All plant basins shall be in good repair. Irrigation system shall be fully operational with all heads properly adjusted for coverage and height related to finish grade. All trees shall be properly staked.
- B. If, after the inspection, the Architect is of the opinion that all work has been performed as per drawings and specifications, the Contractor will be given written notice that the maintenance period may begin.
- C. Final inspection will be made at the end of the maintenance period, provided all deficiencies brought out during that time have been corrected. If these deficiencies have not been corrected by the end of the stated maintenance period, the Landscape Contractor shall continue to maintain the project at his own expense beyond the specified time. When all deficiencies have been corrected, the final inspection will be held with the Landscape Architect and the Owner.

3.08 WARRANTY AND REPLACEMENT:

- A. Except for loss beyond control of the Landscape Contractor, replacement of trees and plants of comparable quality and size shall be made by the Landscape Contractor. Replacement trees and plants shall be installed and guaranteed as specified for original planting.
- B. The Landscape Contractor shall be held responsible for repair of damages resulting from the defects, materials equipment of workmanship during the execution of his contract.
- C. Contractor shall not be held liable for loss of plant materials during the warranty period due to lack of care by others, vandalism, or accidental causes.

END OF SECTION

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment and services necessary to furnish and install Asphalt Concrete Paving, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
02-200	EARTHWORK
02-280	SOIL TREATMENT (Formerly Soil Poisoning)
03-300	CAST-IN-PLACE CONCRETE
09-900	PAINTING

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

SS-CDOT “Standard Specification”, State of California, Department of Transportation (Caltrans).

1.04 SUBMITTALS:

- A. Product Data: Sealer data in accordance with Section 01-300 SUBMITTALS.
- B. Application Certificate: Letter on applicators letterhead certifying Sealer materials and applications were in accordance with Manufacturer’s specifications.

1.05 PRODUCT HANDLING:

- A. Delivery:
 - 1. Deliver products to site prior to installation.
 - 2. Deliver products in properly identified containers with manufacturer’s name and product name.
- B. Handling:
 - 1. Empty containers shall not be removed from site without Architect’s approval.

PART 2 - PRODUCTS

2.01 AGGREGATE BASE:

- A. Three-fourth inch grade, Class 2 in accordance with Section 26, SS-CDOT.

2.02 ASPHALTIC EMULSIONS:

- A. In accordance with Section 94, “Asphaltic Emulsions”, SS-CDOT.

2.03 ASPHALT CONCRETE:

- A. Type B in accordance with Section 39, SS-CDOT.
 - 1. High Temperature Asphalt Concrete - AR-8000.
 - 2. Low Temperature Asphalt Concrete - AR-4000.

2.04 SEALER:

- A. Sealer – GUARDTOP ULTRA mineral and fiber reinforced Asphaltic Emulsion or approved equivalent.
- B. Walk Sealer - “Plush Tex” product of KOCH INDUSTRIES or approved equivalent, and AQMCD requirements.

2.05 TRAFFIC STRIPES AND PAVEMENT MARKINGS:

- A. In accordance with Section 84, SS-CDOT, and Air Quality Management Control District requirements where the project is located.

PART 3 - EXECUTION

3.01 INSTALLATION STANDARDS:

- A. On-Site: In accordance with SS-CDOT.

3.02 PREPARATION:

- A. Sub-grade shall be dry and free of debris.
- B. Do not begin work until sub-grade is in a condition satisfactory to Soils Engineer.

3.03 INSTALLATION OF AGGREGATE BASE: See Detail on Page 4.

- A. Install Aggregate Base over approved sub-grade.
- B. Thickness as indicated on the drawings.
- C. Compaction - Compact each layer to not less than 95% as determined by California Test Method No. 216, in accordance with SS-CDOT.

3.04 APPLICATION OF ASPHALTIC EMULSIONS:

- A. Apply to concrete surfaces which will be in contact with Asphalt Concrete Surfacing.

3.05 INSTALLATION OF ASPHALTIC CONCRETE: See Detail on Page 4.

- A. Contact Architect 72 hours prior to installation.
- B. Thickness - As indicated on drawings.
- C. Asphalt type:
 - 1. When temperature is above 75 degrees use AR 8000.
 - 2. When temperature is below 75 degrees use AR 4000.
- D. Compaction Equipment - In accordance with Section 39, SS-CDOT. At small difficult areas, equipment may be altered as approved by Architect.
- E. The completed surface shall be thoroughly compacted, free from ruts, depressions, and irregularities and to be true to grade and cross section.

3.06 APPLICATION OF SEALER:

- A. Allow Asphalt Concrete to cure 7 days minimum.
- B. Broom clean Asphalt Concrete.
- C. Sealer Type:
 - 1. Apply Sealer to all Asphalt Concrete paving except at play areas.
 - 2. Apply Walk Sealer to Asphalt Concrete at play areas.
- D. Apply Sealer in accordance with manufacturer's specifications,
- E. Protect sealed surface until it is cured.

3.07 STRIPING AND SIGN PAINTING:

- A. Provide and install lane and parking stall division striping and handicapped parking and directional symbols as required by codes, and as shown.

END OF SECTION

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SCOPE

A. Section Includes:

1. Provide all material, labor, equipment and services necessary to completely install all Concrete Formwork materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

00-700	GENERAL CONDITIONS
02-200	EARTHWORK
03-200	CONCRETE REINFORCEMENT
03-251	EXPANSION ANCHORS
03-300	CAST-IN-PLACE CONCRETE
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
06-100	ROUGH CARPENTRY
07-900	JOINT SEALERS
DIV. 15	MECHANICAL
DIV. 16	ELECTRICAL

1.03 SUBMITTALS

A. Submit in accordance with Specification Section 01-300 - Submittals:

1. Product Data.
 - a. Forming materials.
2. Samples.
 - a. form liners for specific finished concrete surfaces.
3. Quality Assurance/Control Submittals
 - a. Manufacturer's Instructions.
 - (1) Instructions for specific form liner manufacturer's indicated.
4. Closeout Submittals in accordance with Specification Sections in Division One:
 - a. Warranty in accordance with Specification Section 01-740-Warranties.

1.04 QUALITY ASSURANCE Per ACI 318-11, Section 6.1

A. Qualifications:

1. Installer Qualifications:
 - a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.

B. Mockups:

1. Cast in accordance with Specification Section 03-300 - Cast-In-Place Concrete.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products specified are from companies listed below. These products listed herein establish the size, patten, color range and function selected by the Architect for this Project. Manufacturers listed as acceptable must still comply with the requirements of the products listed in order to be approved as an equivalent during the Submittal Process. If not approved during the Submittal Process, the Contractor shall submit product specified.
1. Circular column forms:
 - a. Fibre FormsSONOCO PRODUCTS COMPANY (800) 959-1301.
 - b. Fiberglass Forms..MOLDED FIBER GLASS COMPANIES (800) 824-3389.
 2. Chamfer Strips.....BURKE COMPANY (209) 435-7800.
 3. Snap Plugs.....BURKE COMPANY (209) 435-7800.
 4. Form Liners..GREENSTREAK ARCHITECTURAL FORM LINERS (800) 325-9504.
 5. Or approved equal.

2.02 MATERIALS

- A. Circular column forms:
1. Type 1: All circular concrete columns identified on the drawings as Type 1 shall be formed with Seamless “Sonotube and Sonovoid Fibre Forms”, as manufactured by SONOCO PRODUCTS COMPANY, to minimize the spiral gaps or seams on the column surface.
 2. Type 2: All circular concrete columns identified on the drawings as Type 2 shall be formed with one piece fiberglass reinforced plastic round column forms, smooth face, with only one seam visible, as manufactured by MOLDED FIBER GLASS COMPANIES.
- B. Exposed finish concrete forms:
1. Provide plywood, metal-framed plywood faced, or other acceptable panel type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on the drawings.
 - a. Type 1: Provide liner panels identified on the drawings as Type 1 that are complying with U.S. Product Standard PS-1, MDO Plywood, B-B, Group 1, EXT-APA, mill-oiled, edge-sealed, with each piece bearing legible inspection trademark.
 - b. Type 2: Provide liner panels identified on the drawings as Type 2 that are complying with U.S. Product Standard PS-1 HDO Plywood, B-B, Group 1, EXT-APA, mill-oiled, edge-sealed, with each piece bearing legible inspection trademark.
- C. Textured finish concrete:
1. Use units of face design, size, arrangement, and configuration to match texture detail shown on the drawings. Provide solid backing and form supports to ensure stability of textured form liners.
 - a. “Uni-Cast” & “Multi-Cast” No. 302 trapezoidal sheets by GREENSTREAK ARCHITECTURAL FORM LINERS.

- D. Unexposed finish concrete forms:
1. Provide plywood, lumber, or another acceptable material. Lumber shall be dressed on at least two edges and one side for tight fit.
 - a. When plywood is used, provide panels complying with U.S. Product Standard PS-1 B-B (Concrete Form) Plywood, Group 1, EXT-APA. mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

2.03 ACCESSORIES

- A. Cement Compound Plugs:
1. Provide gray colored cement compound plugs (“SnaPlug” by BURKE) in highly visible concrete surface areas.
 - a. Type 1: Provide “flush type” in cone holes of size appropriate to hole size created by tie-holes.
 - b. Type 2: Provide “reveal type” in cone holes of size appropriate to hole size created by tie-holes, to create 1/4” reveal.
 2. Provide a waterproof neoprene adhesive (“SnaPlug Bonder” by BURKE), resistant to weather aging and bacterial growth, for adhering cement compound plugs into cone holes.
- B. Chamfer Strips:
1. Type 1: Provide wood chamfer strips identified on the drawings as Type 1, free of knots, for forming edges of Cast-In-Place Concrete.
 2. Type 2: Provide PVC chamfer strips identified on the drawings as Type 2, as manufactured by BURKE, for forming edges of Cast-In-Place Concrete.
- C. Double Sided Form Tape: Provide “Scotch” double sided, high density, pressure sensitive adhesive, foam tape as manufactured by 3M PRODUCTS, INC.
- D. Form release agent:
1. Provide commercial formulation form release agent with a maximum of 350 mg/l volatile organic compounds (VOC’s) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- E. Rustication Strips:
1. Type 1: Provide wood rustication strips identified on the drawings as Type 1, free of knots, for forming continuous reveals (either vertically or horizontally).
 2. Type 2: Provide PVC rustication strips identified on the drawings as Type 2, as manufactured by BURKE, for forming continuous reveals (either vertically or horizontally).
- F. Spreaders and ties for loose plywood forming:
1. Type 1: Use metal spreaders and ties. Use type that will give positive tying and accurate spreading for accurate sizing of cast walls or forms. Snap type shall leave no metal closer than 1-1/2 inches from exposed surface of concrete and have spreader cones no larger than 1 inch diameter.
 2. Type 2: Use a five-sided head metal snap tie (“Penta-Ties” by BURKE) with breakback point. Size and gage dependent on wall or form thicknesses to be cast.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Surface preparation:
1. Consult with other Trades relative to required openings, and items to be imbedded in concrete (i.e., reglets, anchors, inserts, sleeves, etc.) Coordinate work specified under other sections to ensure proper, adequate interfacing between trades, for openings, chases, blockouts, and other required interfacing items.

3.02 ERECTION

- A. All formwork shall be:
1. Designed and fabricated and erected in accordance with CBC Section 1906.1 A and ACI 318 Section 6.1 "Recommended Practice for Concrete Formwork", except as modified in this article.
 2. Provide wood forms, unless otherwise noted.
 3. Construct to size, shape, alignment, elevation and position of all concrete elements.
 - a. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustication's, reglets, chamfers, blocking, screeds, bulkheads, anchorage's, inserts, and other features required in the work. Use selected materials to obtain required finishes.
 - b. Orientate circular fiberglass forms so that the seam is always in the plane of an adjacent wall, or an obscure side not highly visible. Contact the Architect for conditions not easily determined.
 4. Properly separate and securely tie with Spreaders and Ties to maintain proper shape. Wood spreaders shall not be allowed to remain in concrete work.
 - a. Use "Penta-Ties" where indicated on the drawings. Glue in cement compound plugs.
 5. Brace, support and center sufficiently to carry without excessive deflection all live and dead loads imposed during construction and placement of concrete, and to insure safety to workers and passersby.
 6. Properly construct to eliminate all open joints or discontinuous surfaces.
 - a. Solidly butt joints with double sided foam tape, apply silicone sealant at concrete face, and provide backup at joints to prevent cement paste or mortar from leaking.
- B. All joints shall be:
1. Uniform and backed by 2 inch material.
 2. Continuous and level or plumb.
 3. Sufficiently tight (with double sided foam tape and silicone sealant) to prevent leakage of cement paste.
 - a. Locate joints of formwork whenever possible at rustication joints.
 4. Subject to Architect's approval.

3.03 INSTALLATION

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position.
1. Access Openings: Shall be provided in forms for cleaning and inspection of forms and reinforcement.
 - a. In Wall Forms: Provide openings for each pour, composed of a form section held out until inside of each formed cavity has been cleaned, so that no “access hole” is visible in the finished concrete surface.
 - b. In Fibre Column Forms: Clean out forms prior to placement of forms and pumping concrete.
 - c. In Fiberglass Column Forms: Clean out forms prior to placement of forms and pumping concrete.
 2. Architectural Concrete elements shall be formed with MDO (or HDO) form plywood only where face uniformity is required such as on signs, plaques, kiosks, and landscape furnishings.
 3. Earth Forms: Side forms of footing may be of earth (Board may be omitted) provided the soil will stand without caving and that earth sides be made with a neat and accurate cut. Footing width to be one inch greater than dimension for each side of formwork omitted.
 4. Formwork above grade (stairs, curbs, exposed faces of concrete foundations, etc.) shall be:
 - a. Plywood type as specified treated with Sealer.
 - b. Constructed with plumb and level joints.
 - c. Separated with removable or snap type Spreaders and Ties. Do not use wire ties.
 5. Indentations in the surface of the concrete left after removal of spreaders and ties shall be filled and sacked unless the architect’s approval is given to do otherwise.
 - a. If the Contractor desires to leave indentations exposed, it is suggested that he submit a form design layout for approval prior to erection.
 - b. Layout would have to present an organized, consistent pattern of design for the entire structure.

3.04 CONSTRUCTION

- A. Special Techniques - Form Removal and Reuse of Forms:
1. All forms shall be completely removed.
 2. Time of Removal:
 - a. Dependent on weather conditions.
 - b. Dependent on seven (7) day cylinder test results.
 - c. Typically:
 - (1) Foundation Side Forms: Five (5) days after concrete is poured.
 - (2) Wall and Column forms: Ten (10) days after concrete is poured.
 - (3) Beam, Slab and Joist Soft Forms: Twenty-One (21) days after concrete is poured. Restore as required to support dead loads and any construction loads applied.
 - d. Subject to the Architect’s approval, the time may be extended if deemed necessary.

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CONCRETE FORMWORK
PAGE 6**

3. Remove forms in a manner which will not harm concrete. Do not hammer or pry against concrete.
4. Nails, tie, wires and form ties shall be cut off flush with face of concrete.
5. Snap type spreaders to be snapped off inside the wall surface.
6. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damage form-facing material will not be acceptable for exposed surfaces. Apply new form-release compound as specified for new formwork.
7. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to the Architect.

B. Site Tolerances:

1. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 318 limits:
 - a. Provide Class A tolerances (permitted irregularities are 1/8" in 10' for both gradual and abrupt) for all concrete surfaces exposed to view, or surfaces that will receive additional applied finishes.
 - (1) Coordinate any gymnasium wood floor tolerances with Specification Section 03-300 - Cast-In-Place Concrete, Part 3 Article titled "CONSTRUCTION".

3.05 ADJUSTING/CLEANING

- A. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent leakage of cement paste and maintain alignment.
- B. Remove all wood used for formwork from trenches. No wood shall be left buried in the earth.
- C. Final cleaning shall be in accordance with Specification Section 01-700 - Project Closeout.

END OF SECTION

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 SCOPE

- A. Section Includes:
1. Provide all material, labor, equipment and services necessary to completely install all Concrete Reinforcing materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

00-700	GENERAL CONDITIONS
03-100	CONCRETE FORMWORK
03-300	CAST-IN-PLACE CONCRETE
05-100	STRUCTURAL METAL AND METAL FABRICATIONS

1.03 SUBMITTALS

- A. Submit in accordance with Specification Section 01-300 - Submittals:
1. Shop Drawings.
 - a. Detail in accordance with ACI "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
 2. Quality Assurance/Control Submittals
 - a. Test Report - Testing Laboratory shall submit to Architect, Structural Engineer and to the DSA one (1) copy of each report showing results of tests.
 - (1) Test reinforcement in accordance with CBC Sections 1913A.2 and the provisions of Specification Section 01-410 - Testing Laboratory Services.
 - (2) Owner will pay for tests of samples taken from identified bundles accompanied by mill analysis.
 - (3) Contractor shall pay or tests required due to lack of positive identification, by means of a back charge by the Owner.
 - (4) Testing Laboratory will be approved by DSA and selected by the Architect and the Owner.
 - b. Welder's Qualifications:
 - (1) Welders shall be recently qualified by Test as prescribed in AWS "Standard Qualifications Procedure".
 3. Closeout Submittals in accordance with Specification Sections in Division One:
 - a. Project Record Documents in accordance with Specification Section 01-720 - Project Record Documents.
 - b. Warranty in accordance with Specification Section 01-740 - Warranties.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. In accordance with the following:
 - a. ACI American Concrete Institute
 - b. AWS American Welding Society
 - c. CRSI Concrete Reinforcing Steel Institute

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packing, shipping, handling, and unloading:
 - 1. Deliver reinforcement to Project plainly tagged, completely fabricated and ready to set.
- B. Storage and protection:
 - 1. Store reinforcement above the ground surface on platforms, skids or other supports, protected from dirt, rust, or other substances which will prevent bonding to the concrete.
 - 2. Use all necessary care to maintain identification after bundles are taken apart.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Reinforcement:
 - 1. Deformed Reinforcing Bars: In accordance with ASTM A 706 AND ASTM A-615, Grade as indicated on the structural drawings.
 - 2. Deformed-Steel Welded Wire Fabric: In accordance with ASTM A 497.
 - 3. Galvanized Reinforcing Bars: In accordance with ASTM A 767, Class II (2.0 oz. zinc psf), hot-dip galvanized after fabrication and bending.
 - 4. Epoxy-Coated Reinforcing Bars: In accordance with ASTM A 775.
 - 5. Reinforcement Tie Wire: In accordance with ASTM A-82, plain, cold-drawn steel.
 - 6. Spirals: Smooth round in accordance with ASTM A-615, or cold drawn ASTM A 82.
 - 7. Welded Wire Fabric: In accordance with ASTM A-185.

2.02 ACCESSORIES

- A. Supports for Reinforcement: Provide bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (color to match adjacent concrete surfaces) in accordance with CRSI Class I, or stainless steel in accordance with CRSI, Class II.
- B. Welding Electrodes: As per AWS D1.4-11.

2.03 FABRICATION

- A. Bending: In accordance with ACI Standard 318 section 7.3.
 - 1. Inside diameter of bends for stirrups and ties shall not be less than 1-1/2 inches for No. 3 bars, 2 inches for No. 4 bars and 2-1/2 inches for No. 5 bars.
 - 2. Where bent bars are straightened: Heating or field bending of bars will only be done in accordance with DSA approval.
 - a. Heat bars to a temperature that will allow straightening with little or no effort, 1000 degrees to 1200 degrees Fahrenheit. Check temperature with temple sticks. Do not permit the temperature of steel to exceed that which corresponds to a cherry-red color.
 - b. Support bars at point of bend.
 - c. Cool bars slowly and uniformly after straightening. Do not quench.
 - d. Perform straightening under the supervision of a testing laboratory when requested by the Architect.

- B. Column ties shall terminate with a minimum turn of 135 degrees plus an extension of at least 6 bar diameters but not less than 4 inches at the free end of bar.

- C. Bar Supports:
 - a. Supports and spacing of spacers per standards set forth by CRS/WCRSI Manual of Standard Practice.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Placing:
 - 1. Place Reinforcement accurately.
 - 2. Tie Reinforcement together at all intersections with Tie Wire.
 - 3. Support Reinforcing Bars by bar supports. Place and secure in accordance with CRSI "Specifications for Placing Bar Supports".
 - 4. Placement and support shall be complete.
 - 5. Do not use Reinforcing Bars with kinks or bends except when detailed on the structural drawings.
 - 6. Architect shall approve placement and support before concrete is deposited.
 - 7. Spiral reinforcing shall comply with ACI 318-19, Section 25.7.

- B. Spacing: Clear space between parallel Reinforcing Bars shall not be less than 1 bar diameter nor less than 1 inch, unless otherwise noted on drawings.

- C. Splicing:
 - 1. At splices, lap Reinforcing Bars 40 diameters minimum unless otherwise indicated on Drawings LAB SCHEDULE.
 - 2. Stagger splices wherever possible.
 - 3. Do not splice Reinforcing Bars in vertical walls and columns except:
 - a. Near floors
 - b. Ductile concrete columns must splice at the centerline of the column height.
 - c. As detailed on the structural drawings.

4. Where vertical Reinforcing Bars are offset at a splice, the slope of the inclined portion of bar with the axis of the column or wall shall not exceed 1 in 6, and shall comply with ACI 318-19, Section 10.7.
5. Lap Welded Wire Fabric not less than 1-1/2 times the spacing of wire in the direction of lap nor less than 8 inches.
6. Mechanical bar splices shall be approved by the Architect and by DSA.

D. Welding:

1. Weld under supervision of qualified Testing Laboratory selected by Owner. Cost of supervision to be paid by the Owner.
2. Weld in accordance with AWS Bulletin D1.4-11.
 - a. Weld only where indicated on the structural drawings.
 - b. Weld only A706 bars, unless approved by the Architect and DSA.
3. Inspection provided per CBC Sections 1705A.3.1.

3.02 CONSTRUCTION

A. Corrective Measures:

1. Notify Architect if conduit, piping, inserts, sleeves, etc. interfere with placement of Concrete Reinforcement as indicated on Drawings. Notify Architect immediately if any Concrete Reinforcement is found to be misplaced after concrete has been poured.
2. Do not cut, bend, kink or hicky misplaced reinforcement.
3. Make corrections only as directed by Architect and approved by DSA.
4. This Contractor shall bear the cost of any alteration, corrections or replacements of Concrete Reinforcing or concrete required because of misplaced reinforcement.

3.03 CLEANING

- A. Reinforcement, at time concrete is placed, shall be free of loose rust scale, mud, oil or other coating that will destroy or reduce the bond.

END OF SECTION

CONCRETE EXPANSION ANCHORS

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment and services necessary for Expansion Anchors in Hardrock and Lightweight Concrete, Concrete Masonry Units, and related items necessary to complete the Project as indicated by the Contract Documents unless otherwise specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

01-300	SUBMITTALS
01-410	TESTING LABORATORY SERVICES
01-420	OWNER'S INSPECTION SERVICE
03-300	CAST-IN-PLACE CONCRETE
08-100	METAL DOORS AND FRAMES

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

ICC	International Code Conference
IR	Interpretation of Regulations, Division of the State Architect, Structural Safety Section

1.04 SYSTEM DESCRIPTION:

A. Maximum values: As determined in compliance with CBC Section 1901A.3 and ACI 318-19 Chapter 17.

1.05 QUALITY ASSURANCE:

- A. Single Source Responsibility: To ensure consistent quality of anchorage, obtain expansion anchors from a single manufacturer.
- B. Manufacturer Qualifications: Provide expansion anchors from a manufacturer that can demonstrate ICC ESR approvals that are current and acceptable to review by the Division of the State Architect.
- C. Job Testing: For verifying satisfactory installation workmanship, an independent laboratory will perform proof load tests for expansion anchors acting in tension in the presence of the project inspector.

1.06 SUBMITTALS:

- A. Product Data: Submit manufacturer's product data for all expansion anchors to be used in this project.
- B. Test Reports: Submit current ICC ES research or evaluation reports evidencing maximum allowable shear and withdrawal load data.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver products in original, unopened packages with manufacturer's labels identifying products legible and intact.
- B. Store materials inside, under cover and in a manner to keep them dry, protected from the weather, surface contamination, corrosion, damage from construction traffic and other causes.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. EXPANSION ANCHORS:
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. HILTI INC (I.C.C. ESR-4266)
 - 2. Or approved equal.
- B. EPOXY ANCHORS:
Hilti HIT-HY200, refer to detail 11 / Sheet S101.

2.02 MATERIALS:

- A. Types of Expansion Anchors:
 - 1. Wedge Anchors: The WEDGE category features a small split expansion ring installed on a tapered (integral cone) part of the stud at the bottom. As the nut is tightened, withdrawing the stud portion from the hole, the expansion ring engages the concrete and is further expanded on the tapered part of the stud.
 - 2. Sleeve Anchors: The SLEEVE category is similar to the wedge except a large expansion sleeve is used instead of a small expansion ring. The outside of the sleeve defines the anchor diameter with the threaded stud being of a smaller diameter since it fits inside the sleeve. The stud has an integral cone expander at the bottom similar to the wedge category. The expansion mechanism is similar to the wedge category except the top of the sleeve is normally in contact with the nut/washer and is initially forced down over the cone expander as the anchor is tightened. As the sleeve is expanded, it engages the concrete and continues to expand as the wedge anchor.
 - 3. Shell Anchors: The SHELL category has the most variations, but all use a tapered cone expander, either internal or external, to expand the shell of the anchor against the hole. The anchor is either hammered down over an external expander or a special tool is used to drive an internal expander further into the anchor.
- B. Provide manufacturers standard zinc plated carbon steel expansion anchors for installation into Hardrock or Lightweight Concrete, Concrete Masonry Units, and in accordance with the drawings and the embedments listed in the tables at the end of this section.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Coordinate and provide anchors and installation instructions from the manufacturer for items to be embedded in Hardrock or Lightweight Concrete construction, and in Concrete Masonry Units construction. Manufacturer's installation instructions shall be available on the project site.

3.02 INSTALLATION:

- A. Fastening to In-Place Construction: 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.
 - 1. Install the anchors in accordance with the requirements given in the ICC ES Evaluation Report for the specific anchor used.
- B. 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.
 - 1. The minimum edge distance for drilled in anchors shall be twelve (12) bolt diameters or as per the anchor's ICC ESR report.
- C. Use care and caution to avoid cutting or damaging reinforcing bars in reinforced concrete and concrete masonry units.
- D. Do not install expansion anchors in recently placed concrete or grout which has not had a minimum 28 day curing period and which has not been accepted as having a minimum compressive strength of 3000 psi for concrete and 2000 psi for grout.

3.03 TESTING:

- A. Perform job testing as called for under PART 1 GENERAL, QUALITY ASSURANCE, per 2022 CBC, 1910A.5 the schedules at the end of this specification, and herein specified.
 - 1. When expansion type anchors are listed for sill plate bolting applications, 10 percent of the anchors shall be tension tested.
 - 2. When expansion-type anchors are used for nonstructural applications such as equipment anchorage, 50 percent or alternate bolts in a group, including at least one-half the anchor in each group, shall be tension tested.
 - 3. The tension testing of the expansion anchors shall be done in the presence of the project inspector and a report of the test results shall be submitted to the enforcement agency (SSS)
- B. The proof load may be applied by any method that will effectively measure the tension in the anchor, such as direct pull with a hydraulic jack, calibrated spring-loading devices, etc.
- C. If any anchor fails testing, test all anchors of the same category not previously tested until twenty (20) consecutive pass, then resume the initial testing frequency.

3.04 MATERIAL & TESTING SCHEDULES:
(REFER TO STRUCTURAL SHEETS FOR ADDITIONAL REQUIREMENTS)

- A. Schedule requirements:
1. Anchor diameter refers to the thread size for the WEDGE & SHELL categories and to the anchor outside diameter for the SLEEVE category.
 2. Apply proof test loads to WEDGE & SLEEVE anchors without removing the nut if possible. If not, remove nut & install a threaded coupler to the same tightness of the original nut using a torque wrench and apply load.
 3. For SLEEVE/SHELL internally threaded categories, verify that the anchor is not prevented from withdrawing by a baseplate or other fixtures. If restraint is found, loosen and shim or remove fixture(s) prior to testing.
 4. Reaction loads from test fixtures may be applied close to the anchor being tested, provided the anchor is not restrained from withdrawing by the fixture(s).
 5. SHELL type anchors should be tested as follows:
 - a. Visually inspect 25% for full expansion as evidenced by the location of the expansion plug in the anchor body. Plug location of a fully expanded anchor should be as recommended by the manufacturer, or, in the absence of such recommendation, as determined on the job site following the manufacturer's installation instructions, and;
 - b. Proof load 5% as indicated in the tables below, but not less than three anchors per day for each different person or crew installing anchors, or;
 - c. Test 50% of the installed anchors per CBC Section 1923A.3.5
 6. Test equipment is to be calibrated by an approved testing laboratory in accordance with standard recognized procedures.
 7. Torque test values for SHELL type anchors are omitted due to lack of data. Torque testing can occur on an individual basis when testing procedures are submitted and approved by the enforcement agency. Tabulated values may be forthcoming once the enforcement agency has more data to evaluate the feasibility of standard torque values.
 8. The following criteria apply for the acceptance of installed anchors:
 - a. HYDRAULIC RAM METHOD: The anchor should have no observable movement at the applicable test load. For wedge and sleeve type anchors, a practical way to determine observable movement is that the washer under the nut becomes loose.
 - b. TORQUE WRENCH METHOD: The applicable test torque must be reached within the following limits:
 - 1) **Wedge or Sleeve type:**

One-half (1/2) turn of the nut.
One-quarter (1/4) turn of the nut for the 3/8 inch sleeve anchor only.
 9. Testing should occur 24 hours minimum after installation of the subject anchors.
 10. Anchors shall be tested in the presence of the Project Inspector of Record.

- B. Required Maximum Test Values for Hardrock or Lightweight Concrete and Concrete Masonry Units in tension for the ranges and sizes stated above for the following manufacturers:

ANCHOR TYPE: WEDGE FOR HARDROCK AND LIGHTWEIGHT CONCRETE

MANUFACTURER: 1. HILTI “KWIK-BOLT-TZ2 – ICC ESR.-4266, December, 2023.

ANCHOR DIAMETER	BOLT DIAMETER	MINIMUM EMBEDMENT (UNLESS OTHERWISE CALLED FOR IN PLANS)	TENSION TEST (lbs.-ft.)	TORQUE TEST (Ft.-lbs.)
-	3/8”	2”	1100	25
-	1/2”	3 1/4”	2000	40
-	5/8”	4”	2300	60
-	3/4”	4 3/4”	3700	110

END OF SECTION

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to complete all Cast-In-Place Concrete and other related items necessary to complete Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
01-410	TESTING LABORATORY SERVICE
02-200	EARTHWORK (Excavating and Backfill)
02-280	SOIL TREATMENT (Formerly Soil Poisoning)
02-430	SITE DRAINAGE (Precast Catch Basins)
02-513	ASPHALT CONCRETE PAVING
03-100	CONCRETE FORMWORK
03-200	CONCRETE REINFORCEMENT
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
06-100	ROUGH CARPENTRY
07-900	JOINT SEALERS (Formerly Caulking)
10-050	MISCELLANEOUS SPECIALTIES
DIV.21, 22, 23	MECHANICAL
DIV.26, 27, 28	ELECTRICAL

1.03 WORK INSTALLED BUT FURNISHED BY OTHERS:

05-100	STRUCTURAL METAL AND METAL FABRICATIONS (Anchor Bolts and Metal Fabrications Embedded in Cast-In-Place Concrete)
06-100	ROUGH CARPENTRY (Anchor Bolt and Connectors Embedded in Cast-In-Place Concrete)

1.04 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

ACI	American Concrete Institute
DSA	Division of the State Architect
RIS	Redwood Inspection Service "Standard Specifications for Grades of California Redwood Lumber"

1.05 QUALITY ASSURANCE:

- A: Allowable Tolerances from Specified Grade:
1. Exterior Slabs: Plus or minus 1/8 inch in 10 foot 0 inches.
 2. Interior Slabs: Plus or minus 1/8 inch in 10 foot 0 inches.

- B: Testing and Inspection:
1. Agent: Qualified person and Testing Laboratory selected by Architect.
 2. Extent: All materials, equipment and placing operations shall be subject to inspection, tests and approval at all times. Agent shall have free and unhampered access to all places where concrete materials are stored, proportioned and mixed.
 3. Reports: Agent shall submit to Architect and to the DSA two copies each of report showing results of tests. Report shall state that tests were made in accordance with specifications. Report shall state whether materials were conformance with specifications.
 4. Costing of testing and inspection will be paid by the Owner unless otherwise specified. Contractor shall pay all costs of reinspection and/or retests due to non-compliance with specifications as a reimbursement directly to the Owner.

1.06 SUBMITTALS:

- A. Mix Designs and material samples as required for testing. Deliver adequate samples to Testing Laboratory at least 14 days prior to any concrete work.
- B. Cement manufacturer's mill certificate of compliance with the Specifications.
- C. Concrete placing record by Owner's inspector.
- D. Provide 3' X 3' x 4" panel of concrete for each type of Cast-In-Place concrete finish required for the project for Architect's approval prior to any concrete work.

1.07 ENVIRONMENTAL REQUIREMENTS:

- A. Cold Weather Requirements:
 1. Do not pour concrete unless air temperature is at least 40 degrees Fahrenheit and rising.
 2. Do not pour concrete on frozen ground or ice.
 3. Heat and otherwise prepare materials in accordance with ACI Standard 306.
 4. Maintain concrete temperature at 50 degrees Fahrenheit (minimum) the first 3 days after pouring. Protect concrete from freezing the first 6 days, after placing.
- B. Hot Weather Requirements: Do not pour when temperature exceeds 90 degrees Fahrenheit. 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 which will impair the required strength or serviceability of the member or structure.

1.08 WARRANTY:

In accordance with 01-740 WARRANTIES.

PART 2 - PRODUCTS

2.01 CONCRETE:

- A. Materials:
1. Cement: Type I or II in accordance with ASTM C 150 (Specifications for Portland Cement) and AC1-318-3.2.
 2. Water: Clean and free from deleterious amount of acids, alkalis, salts, organic material, or other substances that may be deleterious to concrete or reinforcing.
 3. Aggregates: Low Absorptive in accordance with CBC Section 1903A.5, AC1-318-26.4.1.2 and ASTM C-33 (Specifications for Concrete Aggregates) and Lightweight aggregates in accordance with ASTM C330. Maximum aggregate size 1-1/2 inches for standard aggregate and 3/4 inches for lightweight aggregates. Coarse aggregate when tested in accordance with State of California Highways Test Methods 217 shall have a cleanliness value of 75 minimum. Fine aggregate when tested in accordance with State of California Test Methods 227 shall have a sand equivalent of 75 minimum. Grading of combined aggregate shall be in accordance with ASTM C33.
 4. Admixtures: Admixtures shall be in accordance with the provisions of AC1-318-3.6, and shall not be used until prior approval from DSA/SSS has been obtained.
- B. Mix Design and Proportions in accordance with ACI 318-19, Section 26.4.3:
1. All standard weigh concrete shall have the following minimum compressive strengths in accordance with CBC Section 1905A.1.9 at 28 days and shall be proportioned within the following limits:
 2. Provide a 4000 psi concrete mix for interior slabs on grade with a water/cement ration of 4.5 gallons/94 lb. sack and Bldg. footings with water/cement ratio of 5.8 gallons/94 lb. sack.

<u>Location of Concrete</u>	<u>Min. psi @ 28 Days</u>	<u>Max. Size Aggregate</u>
Footings, Grade Beams	3,000	1-1/2 inch
Floor Slabs & Columns (Lightweight Concrete)	4,000	1-0 inch 3/4 inch
Site Work and other concrete	3,000	1-0 inch
Architectural Concrete (As indicated below)	3,000	3/8 inch
Electrical Conduit Encasements & backfill under footings	1,500	3/8 inch
Maximum water-cement ratio:		
6.6 gallons per 94 lb. sack for	3,000	
7.3 gallons per 94 lb. sack for	2,500	

Note: Maximum slump for all mixes is 4 inches, plus or minus one inch except 3 inches maximum for slabs. Maximum slump for 5,000 mix shall be determined by Testing Laboratory. Aggregate size may be determined by bar spacing - see Section 03-200, article 3.01B

2. Standard weigh concrete shall contain 5-1/2 sacks of regular Type I or II cement minimum per cu. yd. of 3,000 lbs. per square inch concrete.
3. Architectural concrete shall be used for all highly detailed non-structural concrete items such as signs, plaques, landscape furnishings, etc. where a high resolution finish is required. Maximum aggregate size shall be 3/8 inch, and cement content shall not be less than 6-1/2 sacks per yard, with plactizing admixtures used to create maximum workability at minimum slump.

C. Laboratory Designed Mix:

1. Strength of Concrete
 - a. Mix proportions shall be determined by approved Testing Laboratory in accordance with ACI 318-19, Section 26.4.3.1(b) and ACI 301.
2. Owner will pay for design.
3. When low absorptive aggregates are used, mix shall be Laboratory Designed Mix.

D. Mixing:

1. Mix in accordance with ACI 318-19, Section 26.5.1.1(d), ASTM C94 or ASTM C685.
2. Inspection of Mix:
 - a. Quality and quantity of material used shall be subject to continuous inspection by a qualified person. Sampling and testing of cement and aggregates in accordance with Title 24, Part 1, section 4-335, and CBC. Continuous batch plant inspection may be waived under the following condition:
 - 1) The concrete plant complies fully with the requirements of ASTM C-94 and has been certified to comply with the requirements of the National Ready Mixed Concrete Association. The plant must be equipped with an automatic batcher in which the total batching cycle, except for the measuring and introduction of an admixture, is completed by activating a single starter device.

NOTE: When batch plant inspection is waived, the following requirements shall apply. The architect or structural engineer in cooperation with the testing agency shall propose a method for quality control acceptable to the Division of the State Architect. A minimum of one set of four cylinders shall be taken and tested for each 50 cubic yards of concrete, 2000 square feet of slab or fraction thereof. The quality of the materials shall be verified by the testing agency.
 - b. Public Weighmaster shall be used to certify quantity of materials subject to approval by Architect and DSA in lieu of continuous plant inspection provided procedures are in accordance with Title 24, Part 1, section 4-335, CBC Section 1705A.3.3. The quality of material used shall be subject to continuous inspection by a qualified person.
 - c. Maintain sources of material supply constantly after approval of concrete mix.

3. Concrete shall be ready-mixed. Measure, agitate and deliver to Project in accordance with ASTM C94.
4. Transit mixed concrete shall be mixed 10 minutes minimum after all ingredients have been added, 5 minutes of which must be after mixer arrives at job site. Do not re-temper concrete.

2.02 MODIFIED MIX CONCRETE: NOT APPLICABLE

2.03 ARCHITECTURAL CONCRETE:

- A. Materials: In accordance with Concrete Material, Article 03-300/2.01.
- B. Mix: Same proportions as concrete mix except omit coarse aggregate and adjust water and admixtures to produce a workable thick consistency. Refer to Article 03-300/2.01, B, of this section for mix design required per ACI 318-19, Section 5.2.
- C. Mixing: In accordance with ACI 318-19, Section 26.5.1.1(d), ASTM C94 or ASTM C685.

2.04 GROUT:

- A. Materials: In accordance with Concrete Materials, Articles 03-300/2.01.
 1. Strength to match adjacent concrete.
- B. Mix: Same proportions as concrete mix except omit coarse aggregate and adjust water to produce a thick consistency. Provide mix design per ACI 318-19, Section 26.4.3.
- C. Mixing: In accordance with ACI 318-19, Section 5.8.

2.05 NON-SHRINK GROUT:

- A. Materials:
 1. "Euco N-S Grout" flowable and self-leveling non-staining, non-metallic grout by THE EUCLID CHEMICAL COMPANY or approved equivalent, in compliance with ASTM C 1090 and ASTM C 1107.
-or-
 2. "POR-ROK" Epoxy Grout by MINWAX CONSTRUCTION PRODUCTS DIVISION, or approved equivalent. Use where indicated on the drawings.
- B. Mixing: In accordance with manufacturer's recommendations and ACI 318-19, Section 26.5.1.1(d), ASTM C94 or ASTM C685.

2.06 DRYPACK:

- A. Materials: In accordance with Concrete Materials Article 03-300/2.01.
 - 1. Strength to match adjacent concrete.
 - 2. "Euco Dry Pack Grout" non-metallic grout by the THE EUCLID CHEMICAL COMPANY or approved equivalent, in compliance with ASTM C 1090 and ASTM C 1107.
- B. Mix: One part cement to 2-1/2 parts of aggregate (all aggregate shall pass No. 4 sieve) mixed with minimum water, or in accordance with manufacturer's recommendations. Consistency shall be such that a ball of drypack compressed in hand maintains its shape, shows finger marks, but shows no surface water.
- C. Mixing: Dry materials to be thoroughly mixed. Water to be added in small amounts and thoroughly mixed in, or in accordance with manufacturer's recommendations.

2.07 MORTAR:

- A. Materials: In accordance with Concrete Materials Article 03-300/2.01.
 - 1. Minimum mortar strength shall be 3000 psi, to match concrete strength.
 - 2. "Euco #456" Modified Polyamide, high modulus mortar, in accordance with ASTM C 881, Grade 1, Type III, Class B & C, and in accordance with ACI 503.1-05-2.1 and 2103A.8 .
- B. Mix: One part cement to 3 parts aggregate (all aggregate shall pass No. 4 sieve), or in accordance with manufacturer's recommendations.
- C. Mixing: Thoroughly mix.

2.08 BONDING AGENT:

- A. "Cemlock" by CONRAD SOVIG COMPANY; "Daraweld-C" by W.R. GRACE AND COMPANY, or approved equivalent.

2.09 EPOXY ANCHORED RODS AND BOLTS:

- A. Holes for anchors 1/8" larger in diameter than "d" of rod or bolt. Depth of hole ten times "d" unless noted otherwise.
 - 1. Epoxy Shall be Simpson set-XP adhesive as manufactured by SIMPSON STRONG-TIE CO. INC. 5956 W. LAS POSITAS BLVD., PLEASANTON, CA. 94588. Installation shall be in accordance with the manufacturer's recommendations and I.C.C. report No. ESR-2508.
 - 2. Testing in accordance with CBC.
 - 3. Clean holes of dust and water before applying epoxy.
 - 4. Or equal.

2.10 CURING PAPER:

- A: "Orange Label Sisalkraft" Curing Paper, by FORTIFIBER CORPORATION, in accordance with ASTM C 171, or approved equivalent.

2.11 CURING COMPOUND:

- A. “Diamond Clear VOX”, non-yellowing, VOC compliant cure and seal, and in accordance with ASTM C 309, as manufactured by THE EUCLID CHEMICAL COMPANY, or approved equivalent.

2.12 EXPANSION FILLER:

KAPCO, 1/4 inch thick, pre-molded asphalt expansion joint filler.

2.13 REDWOOD FILLER:

- A. Selected sound heart redwood in accordance with RIS Section 211 (c).

2.14 FLOOR HARDENER:

- A. “Kemi-Kal” liquid floor hardener product of CONRAD SOVIG COMPANY, INC. or approved equal.

2.15 SACK FINISH:

- A. Material: In accordance with Article 03-300/3.11 Concrete Materials. Sand shall be fine complying with #100 mesh sieve 100% passing.
- B. Mix: One part cement to one part fine sand with enough water to provide a creamy consistency.

2.16 VAPOR BARRIER/SAND CUSHION:

- A. All interior concrete floor slabs on grade shall be placed over a continuous and unbroken 15 mil Stegowrap vapor barrier Class A set on 2” sand cushion pad with a 2” sand cushion over the vapor barrier.
 - 1. All lap joints shall be 12 inches minimum, and sealed with 2 inch wide pressure sensitive Tape and per vapor barrier manufacturers instructions

2.17 ARCHITECTURAL LETTERS: (If applicable)

- A. Standard or custom styrofoam insert type in style(s) indicated on the drawings, as manufactured by LABRADO FORMS, INC., 23011 Moulton Parkway, Unit J-4, Laguna Hills, California 92653, (714) 830-9464.

2.18 EXPOSED AGGREGATE FINISH: (If applicable)

In accordance with Article 03-300/2.01 Concrete, except surface aggregate shall be 3/8 inch maximum per gravel.

2.19 COLORED HARDENER: NOT APPLICABLE

- A. Lithochrome Color Hardener manufactured by L.M. SCOFIELD COMPANY, Los Angeles, California 90040, and clearly labeled "BOMANITE APPROVED". These ready-to-use, dry-shake type colored hardeners are streak-free integrinds of pigments, surface conditioning and dispersing agents, and portland cement, blended with hard, graded aggregate. The particular color shall be as selected by the Architect.

2.20 COLORED CURING COMPOUND: NOT APPLICABLE

- A. Lithochrome Colorwax, manufactured by L.M. SCHOLFIELD COMPANY, Los Angeles, California 90040, complying with ASTM C 309 as a curing membrane and with all applicable air pollution regulations and clearly labeled "BOMANITE APPROVED".

2.21 INDUSTRIAL FLOOR SEALER: (I.F.S.)

- A. "Diamond Clear VOX" first coat at a rate of 300 sq. ft. per gallon immediately upon completion of the placing and finishing operation, and a second coat applied to completely clean floors of "Floor Seal VOX" at a rate o 325 sq. ft. per gallon upon completion of the project. All products mentioned shall be provided by THE EUCLID COMPANY, or approved equivalent.

PART 3 - EXECUTION

3.01 UNSUITABLE BEARING:

- A. Contractor shall inspect bearing soil and report soft or loose unsuitable bearing soil to Architect.
- B. Architect will furnish Contractor with corrective measures necessary to remedy field condition.
- C. Do not pour concrete until unsuitable bearing surfaces are corrected.
- D. At undistured bearing soil: Corrective measures will be allowed as an "extra" and will be paid by Owner as specified in General Conditions.
- E. At Engineered Fill, remove soft and loose unsuitable fill and replace with concrete. Cost shall be paid by Contractor.

3.02 PREPARATION FOR PLACING:

- A. Remove all water from excavation. Divert flow of water through drains using methods to avoid washing over freshly deposited concrete.
- B. Remove hardened concrete, wood chips, shavings and other debris from interior of forms and from reinforcing steel by vacuum process.
- C. Do not wet forms, footing excavations, masonry or concrete against which concrete is deposited.
- D. Secure in position reinforcing and other work to be embedded in concrete. Positioning dowels and anchors for concrete block masonry is specified in Section 04-220.

- E. Obtain Architect's inspection and approval for all forms, reinforcing, and items to be embedded in concrete before pouring concrete.
- F. Provide runways or other approved means for wheeled equipment. Do not wheel equipment over reinforcing or formwork.
- G. At old concrete or concrete which has begun to set upon which Concrete is to be placed:
 - 1. Surface shall be level, cleaned of all laitance and rough with solidly embedded large aggregate exposed.
 - 2. Rough surface by chipping entire surface not earlier than 5 days after set, by high pressure hosing (80 pounds per square inch) 2 to 4 hours after placing or by sand blasting with coarse silica sand, roughness amplitude shall be at least 1/4 inch.
 - 3. Not more than 1/2 hour prior to pouring concrete, place 2 inch thick uniform layer of grout on old concrete.

3.03 TRANSPORTATION OF CONCRETE:

- A. Handle Concrete from mixer to place of final deposit as rapidly as practical by methods which shall prevent the separation or loss of the ingredients in accordance with ACI Standard 530.1-05-1.7, and ACI 318-19, Section 5.9.
- B. Do not move concrete horizontally by means of vibrators.

3.04 PLACING OF CONCRETE:

- A. General:
 - 1. All concrete shall be placed under direct supervision of the Architect, Structural Engineer or Owner's Inspector per CBC Section 1705A.3.
 - 2. Notify DSA not less than 48 hours prior to pouring of first concrete.
 - 3. Place concrete in accordance with ACI 318-19, Section 26.5.2.
 - 4. Do not place Concrete outside of regular working hours except to complete work already started.
 - 5. Do not use Concrete which has been mixed for a period longer than 1-1/2 hours or which has started to stiffen or set.
 - 6. Remixing of concrete which has started to set shall not be permitted.
 - 7. Pouring of concrete shall be a continuous operation until the completion of the Section or Panel in accordance with ACI Standard 304.
 - 8. Consolidate concrete by mechanical internal vibrators supplement by hand spading and rodding in accordance with ACI Standard 304.
 - 9. Keep a record of times, dates and locations of all concrete placing operations for the duration of the project. Record shall be available to Architect at all times.

- B. At Footings and Columns, etc.:
1. Concrete shall be placed in layers not to exceed 24 inches in depth, and shall be thoroughly compacted. Wait forty minutes before placing next layer. Revibrate 6 inches into previous lift before next lift is added. Locate top of lift at or below top of wall opening.
 2. Use opening in forms, elephant trucks or other approved methods to prevent accumulation of concrete on forms and reinforcement above the level of pour. Unconfined free falls shall not exceed 5 feet.
 3. Where placing or consolidation is restricted by close assemblage of reinforcing and/or forms use a Modified Mix Concrete with smaller aggregate.
- C. At Slab on Ground:
1. Slabs on ground shall not be poured until the sub-grade has been thoroughly compacted and properly prepared, nor until reinforcement and insert are securely fastened in place. Sub-grade shall be lightly moistened before pouring concrete.
 2. No greater area shall be poured at one time than can be properly finished without checking.
 3. Concrete shall be poured as dry as possible, consistent with good workmanship.
 4. Concrete shall be compacted by hand tamping and by mechanical vibration. After the concrete is thoroughly compacted, the surface shall be screeded off, any surface water removed and finish applied as specified.
- D. By Pumps:
1. If pumps are used to place concrete, the fines (3/8" and smaller) shall not exceed 45% of the total volume of aggregate. Standby equipment must be provided to insure completing pours to planned cutoffs.
 2. Pumps shall handle concrete at a uniform rate without bleeding or segregation of aggregates. Concrete from end of the hose shall have a free fall not to exceed four feet. Aluminum pipe shall not be used to transport pumped concrete.

3.05 FINISHING OF CONCRETE:

- A. All concrete shall be finished in accordance with the requirements for the finish materials to be applied.
- B. Interior Slabs: Smooth steel trowel finish for all slabs with floor covering scheduled, and "sweat trowel"(slip resistant) finish for all exposed slabs, with maximum surface variation of 1/8 inch in 10 feet.
- C. Exterior Slabs: "Sweat trowel" (slip resistant) finish with maximum surface variation of 1/8 inch in 10 feet.
- D. Ramps/Walks (Sidewalks): Medium broom finish at slopes < 6%, perpendicular to direction of traffic. Heavy broom finish at slopes > 6%.

- E. Installation of Floor Hardener Finish:
 - 1. Location: Refer to Drawings.
 - 2. Floor Preparation:
 - a. Cure concrete for 28 days minimum.
 - b. Concrete to be completely dry.
 - c. Remove all paint, dirt, grease, oil, etc. with caustic soda water solution or other means.
 - 3. Application:
 - a. Apply in accordance with manufacturer's instructions.
 - b. By manufacturer's authorized applicator, using only workmen experienced in this type of Work.

- F. Installation of Exposed Aggregate Finish Concrete:
 - 1. Location: Refer to Drawings.
 - 2. Slab shall be Exposed Aggregate Mix Concrete.
 - 3. Method of Exposure: Wash and Brush surface when concrete has cured sufficiently to hold aggregate but soft enough to remove surface cement.
 - 4. Quality of Workmanship: In accordance with approved 3'X3'x4" mock-up.

3.06 CURING AND PROTECTION OF CONCRETE:

- A. General: Cure and protect all concrete by preventing loss of moisture, rapid temperature change and mechanical injury or injury from rain or flowing water for a period of 10 days. Start curing when free water disappears from the surface of concrete, usually when finishing is completed. Fog sprays may be required to prevent excessive moisture loss.

- B. Formed Surfaces; Wet forms immediately after pouring. Keep forms and exposed surfaces wet until forms are removed. Keep all surfaces wet after forms are removed for 10 days after placement of Concrete.

- C. Concrete Slabs:
 - 1. Slabs not receiving flooring covering: Apply one spray coat curing compound in accordance with manufacturer's recommendations.
 - 2. Slabs receiving floor covering: Apply Curing Paper in accordance with manufacturer's recommendations as soon as surface will permit. Keep slab wet under paper for 7 days minimum. Paper to remain on slab after curing for slab protection as per ACI Standard 305.
 - 3. Protect all exposed surfaces with Curing Paper.

3.07 CONSTRUCTION JOINTS:

- A. Locate construction joints shown on Drawings and as directed by the Architect and Structural Engineer. Clean all horizontal joints and roughen in accordance with CBC Section 1906.4.

- B. Pour lengths as shown on Drawings. If not shown on Drawings, pour lengths at:
 - 1. Foundations100 feet maximum
 - 2. Walls 60 feet maximum
 - 3. Structural Slabs 60 feet maximum
 - 4. Slabs on grade (interior) 30 feet maximum
 - 5. Slabs on grade (exterior) 12 feet maximum

- C. Horizontal Wall and Column Joints:
 - 1. Prepare joints in accordance with paragraph 03-300/3.02. G.
 - 2. Joints when completed shall be true, straight, horizontal, and free of “overhangs” or lips.
- D. All joint locations shall have Architect approval.

3.08 EXPANSION AND CONTROL JOINTS:

- A. Expansion Joints, typical:
 - 1. Location: In all exterior slabs, walks, curbs, gutters, etc.
 - a. Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as indicated on the drawings.
 - 2. Spacing:
 - a. At walks, curbs, gutters, etc. maximum spacing 30 feet on center unless otherwise indicated on Drawings.
 - b. At slab within building: At locations indicated on drawings.
 - 3. Installation:
 - a. Install Expansion Filler in expansion joints.
 - b. “Glue” Expansion Filler to edge of previous pour.
 - c. Top of Expansion Filler parallel with top of slab and 1/4 inch below and level with slab surface.
 - d. When concrete has taken initial set, the edge of concrete surface shall be rounded by tooling to top of Expansion Filler.
 - e. Refer to Drawings for detail.
- B. Control Joints, typical:
 - 1. Construct control joints (contraction joints in slabs-on-ground to form panels of patterns as shown on the drawings. If no joint pattern is shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays, etc). Use saw cuts 1/8 inch wide by 1/4 inch slab depth, or tooled joints with rounded edges at small slab widths, unless otherwise indicated.
 - a. Control joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing without dislodging aggregate.
- C. All joints (expansion and control joints) are to be straight and true to pattern indicated with no spalling of edges on either side of the joint.

3.09 CONCRETE COMPRESSION TESTS:

- A. Testing Agent will make, cure and test concrete compression cylinders in accordance with ASTM C31, C39 and C172.
- B. Make a set of 4 concrete compression cylinders from each 50 cubic yards of each class of concrete, or fraction thereof, placed each day. From each set, test one cylinder at age 7 days, test two cylinders at age 28 days per ASTM C39 and hold one cylinder for test only if directed by the Architect. Cylinders shall be identified as to area from which they were taken and show the date and time of day they were prepared.

3.10 INSTALLATION OF NON-SHRINK GROUT:

- A. Install under base plates immediately after erection of structural steel.
- B. Installation of Drypack:
 - 1. General: Ram in thin layers, using a short length of ram, the free end of which shall be struck with a heavy hammer or mallet, several blows for each layer, to compact in the mixture. When completed, the exposed drypack shall show slight indication of moisture.
 - 2. Curing: Cure with a curing agent or with burlap kept wet.

3.11 DEFECTIVE WORK:

- A. Minor Defects:
 - 1. Immediately after removing forms, inspect all concrete surfaces. Patch any pour joints, voids, rock pockets, tie holes, etc., as soon as possible, but not until the defect has been examined by the Architect or his representative.
 - 2. Chip away defective areas to a minimum depth of one inch, with edges perpendicular to surface. Clean area to be patched of all laitance.
 - 3. Coat area to be patched with Bonding Agent. Patch with Mortar mixed with Bonding Agent thoroughly compacted into place and screeded off to leave the patch slightly higher than the surrounding surface. After at least one hour finish patch to match the adjoining surface. Cure patch by application of curing compound or by wetting for 7 days.
 - 4. Fill tie holes solid with mortar after cleaning and thoroughly wetting. Fill through holes by means of a plunger-type grease gun.
 - 5. Remove fins and rough surfaces from all exposed concrete.
- B. Serious Defects:
 - 1. If defects are serious or affect strength of structure or if patching does not satisfactorily restore quality and appearance of surface, repair defects by complete removal of concrete and replacement.
 - 2. Defect shall not be repaired until examined by Architect and repair shall be in accordance with Architect's instruction.
- C. Cost of repairing shall be borne by the Contractor.

3.12 CLEANING:

The top of all concrete foundations receiving concrete blocks shall be washed free of all laitance and loose concrete, and roughened to a roughness amplitude of 1/4".

END OF SECTION

STRUCTURAL METAL AND METAL FABRICATIONS

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to install all Structural Metal and Metal Fabrications, accessories and other related items necessary to complete Project as indicated on the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

03-300 CAST-IN-PLACE CONCRETE
07-600 FLASHING AND SHEET METAL
09-900 PAINTING

1.03 WORK FURNISHED BUT NOT INSTALLED:

03-300 CAST-IN-PLACE CONCRETE (Anchors and Metal Fabrications
Embedded in Concrete)
06-100 ROUGH CARPENTRY (Special Metal Anchorage)

All items in Article 05-100, 3.04, Metal Fabrication Schedule.

1.04 STANDARDS:

In accordance with 01-080 Codes and Standards and the following:

AISC American Institute of Steel Construction "Specification for Design,
Fabrication and Erection of Structural Steel Buildings" and "Code of
Standard Practice for Steel Buildings and Bridges" and "Recommended
Procedure for Identification of High Strength Steel During Fabrication"
AWS American Welding Society "Structural Welding Code".
SSPC Steel Structures Painting Council, "Surface Preparation Specifications".
ICC International Code Council.

1.05 QUALITY ASSURANCE:

- A. Applicators Qualifications: Welders shall be recently qualified by Test as Prescribed in AWS D1.1 "Structural Welding Code" for the type of welding to be performed.
- B. Testing and Inspection - In accordance with 01-410 Testing Laboratory Services and the following:
1. Testing Agent: Qualified person or Testing Laboratory listed and approved by and selected by the Architect, and the Owner.
 2. Testing Agent shall make Test and Inspection Reports certifying materials and workmanship to conform with Drawings and Specifications.

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STRUCTURAL METAL AND
METAL FABRICATIONS
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3. Cost of Testing and Inspection will be paid by Owner unless otherwise specified.
4. Cost of cutting and machining test samples shall be paid by Contractor.
5. Materials shall be certified, identified and tested in conformance with CBC Section 2203A, 1705A.2 & 2213.A.1.
6. Commercial stock steel shall be identified in accordance with CBC 2203A.1.
7. Complete four-sided inspection of all steel shall be made when required by Architect.
8. Test and inspection of Shop and field welding in accordance with CBC Section 1705A.2.5. Perform shop and field welding only under supervision of welding inspector.
 - a. Welds shall be in accordance with CBC Section 2204A.1.
 - b. Inspection shall be in accordance with CBC Section 1705A.2.

1.06 **SUBMITTALS:**

- A. Submit Shop Drawings in accordance with Section 01-300. Include all information necessary for the fabrication of component parts. Indicate size and weight of members, type and location of shop and field connections, size and extent of all welds, and welding sequence when required.
- B. Submit mill analyses and test reports for each heat, in accordance with ASTM A6 certifying conformity with the specifications. Steel shall be identifiable in the fabricating shop.

1.07 **SCHEDULING:**

- A. Schedule the Work so that there will be no excessive inspection time. At all times that an inspector is required, sufficient work shall be laid out and adequate personnel supplied so that the inspector's time will be used to full advantage. If inspection costs become excessive because of poor shop procedure, such excess costs will be paid for by the Owner, but deducted from the Contract Price. Poor procedures will be determined upon review of Inspection and/or Testing Reports.

The rate for charging the excess costs will be as follows:

 1. Minimum of three (3) certified welders are used, Owner will pay 100 percent.
 2. Only two (2) certified welders are used, Contractor will be charge 1/3 of the Inspection cost.
 3. Only one (1) certified welder is used, the Contractor will be charged 2/3 of the inspection cost.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Structural Steel: Shall be made in accordance with “Specifications for Structural Steel”, ASTM Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling, A6 unless otherwise noted on Drawings.
- B. Steel Pipe: Shall be Type E or S, Grade B in accordance with “Specifications for Welded and Seamless Steel Pipe”, ASTM A 53.
- C. Structural Tubes: Rectangular, Square and Round HSS shall be in accordance with ASTM A500 Grade B.
- D. Machine Bolts or nonheaded Anchor Bolts: In accordance with ASTM A 307 Grade C for structural.
 - 1. Provide Concrete Expansion Anchors from a manufacturer that can demonstrate ICC ESR approvals that are current and acceptable to review by Architect.
- E. High Strength Bolts: In accordance with ASTM A 325.
- F. Filler Metal and Flux for Welding: In accordance with AWS D1.1-10 and E70XX.
- G. Hot Dipped Galvanized: In accordance with ASTM A 123.
- H. Light Gauge Cold Formed Steel Shapes: In accordance with ASTM A1011 and A653 as specified on the structural drawings.
- I. Primers (“Sinclair” or approved equivalent):
 - 1. Ferrous Metal #15
 - 2. Galvanized Metal #14n
 - 3. Aluminum #14n
- J. Steel Bar Grating, primed for field finish painting, as indicated on the drawings for the Gymnasium Buildings.
- K. Wide Flange Beams: In accordance with ASTM A992.
- L. Anchor Bolts: In accordance with ASTM F 1554, Grade 36.

2.02 FABRICATION:

- A. Fabricate in accordance with AISC Spec and AISC Code unless otherwise indicated on Drawings or Specifications.
- B. Fabricate all structural steel members and fittings.
- C. Fabricate all items scheduled in 05-100, 3.04.

2.03 SHOP COAT PAINTING

- A. Preparation:
 - 1. All surfaces to be painted shall be clean of loose scale, rust, grease or dirt accordance with SSPC-SP2 or equal.
 - 2. Prior to brushing, remove grease, oil, salt, chemicals, dusts and similar contaminants by chemical cleaning, Rust-Oleum Surfa-Etch or equal.
 - 3. After brushing, remove all sand, dust and grit with a vacuum cleaner, compressed air (clean and dry) or a clean brush. Before applying prime coat, wet down areas in closed proximity to surfaces to be coated, to prevent windblown debris from contaminating the work.
 - 4. Brushed surfaces must be coated as soon as possible before the cleaned surface can become contaminated.
- B. Paint all surfaces of steel not encased in concrete with one coat of primer.
- C. Paint all surfaces of steel in contact with concrete but not encased, with one coat of primer.
- D. Paint all surfaces of steel not in contact with concrete but inaccessible after fabrication or erection with 2 coats of primer or heavy duty primer.
- E. Hot-Dip Galvanizing: Zinc coatings on iron and steel in accordance with ASTM A-123 and ASTM A-153.
- F. All surfaces scheduled to receive "Sprayed Fireproofing" will not have primers or paint applied.

PART 3 - EXECUTION

3.01 ERECTION:

- A. Erect all Structural Metal framework in accordance with AISC Specifications and AISC Code unless otherwise indicated on Drawings or Specification.
- B. Framing: Carry up framing true and plumb. Provide temporary bracing wherever necessary to support all loads to which the structure may be subjected, including erection equipment and its operation. Leave bracing in place as long as may be required for safety. As erection progresses securely connect the work to take care of all dead load, wind and erection stresses.
- C. Connections:
 - 1. Machine Bolts shall be installed with cut washer under nut.

2. Welding: The details of all joints, the technique of welding employed, the appearance and quality of welds made, and the methods used in correcting defective work shall conform to "AISC Specs", AWS Code", CBC Sections 2204A.1.
 - a) All "exposed-to-view" welds will be ground smooth and flush with no voids showing and still be in conformance with standards referenced herein.
 - b) All exposed to view butt welds shall be ground as flush as connected members will allow. Minor defects and transitions in metal surfaces may be filled and sanded out with an approved metal filler prior to painting.
 - c) Exposed fillet welds are acceptable "as is" provided the surface chevrons are hollow and have no abrupt protrusions.

- D. Cutting Holes: The use of a cutting torch is permissible only if the metal being cut is not carrying stress during the operation and only with the prior approval of the Architect for each specific condition.

- E. Setting Plates: Set column base plates and leveling plates to correct elevations and temporarily support on steel wedges or shims until the supported members have been plumbed, locked in place and grouted.

3.02 FIELD PAINTING:

After erection, all portions of shop-coated metal from which paint has been removed in handling and erection, all rivet heads and bolts, burned areas (these shall be scraped clean) shall be touched up with same paint as shop coat.

3.03 DEFECTIVE WORK:

Defective Work shall be immediately replaced with proper work. Such replaced Work and the Testing and Inspection for same shall be at the expense of the Contractor. If defects or damages cannot be corrected in the field, the material shall be returned to the shop or new parts furnished, as the Architect directs, and the Contractor shall pay all costs therefor.

3.04 METAL FABRICATION SCHEDULE:

Metal Fabrication Schedule should be used as a guide only and is not considered as a complete list.

- A. Refer Drawings for location and details:
 1. Structured Steel Columns & Beams
 2. Steel pipe
 3. Pipe Rails
 4. Counter Top support brackets.
 5. Angle lintels.
 6. Miscellaneous backing members, brackets, and supports for work installed by other trades.

END OF SECTION

METAL DECKING

PART 1 - GENERAL

1.01 SCOPE:

- A. Section Includes:
1. Provide all material, labor, equipment and services necessary to completely install all Metal Decking materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
03-300	CAST-IN-PLACE CONCRETE
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
07-200	BUILDING INSULATION
07-310	FIBERGLASS SHINGLE ROOFING
07-410	METAL PANELS
07-531	SINGLE-PLY MEMBRANE
07-600	FLASHING AND SHEET METAL
07-830	ROOF HATCHES
07-900	JOINT SEALERS
09-900	PAINTING
DIV.15	MECHANICAL SECTIONS (PENETRATIONS)
DIV.16	ELECTRICAL SECTIONS (PENETRATIONS)

1.03 SUBMITTALS

- A. Submit in accordance with Specifications Section 01-300 - Submittals:
1. Product Data.
 - a. Include all accessories such as Metal Trim, Flute Closure Trim, Neoprene Closure Tape, Joint Covers and Sound Insulation Batts [sized to fit flute profile].
 2. Shop Drawings.
 3. Quality Assurance/Control Submittals
 - a. Design Data - One for the Architect, Structural Engineer, Contractor, Owner and DSA:
 - (1) Submit five [5] copies of manufacturer's design data indicating Metal Panel Section Properties [including gage, weight in pounds per ft.2, I+ and I-(in.4/ft), S+ and S-(in.3/ft2), and profile dimensions].
 - b. Test Reports - One for the Architect, Structural Engineer, Contractor, Owner and DSA:
 - (1) Submit five [5] copies of Steel Mill Test Reports establishing conformity with these Specifications in accordance with CBC Section 2203A.1.
 - (2) Submit five [5] copies of Shop and Field Welding Tests and Inspection Reports.
 4. Closeout Submittals in accordance with Specification Sections in Division One:
 - a. Project Record Documents in accordance with Specification Section 01-720-Project Record Documents.

1.04 QUALITY ASSURANCE:

- A. Qualifications:
1. Material Qualifications:
 - a. Materials shall be identified and tested in conformance with CBC Section 2203A.
 2. Installer Qualifications:
 - a. Engage an experienced Installer who has successfully completed three [3] projects of similar scope and size to that indicated for this Project.
 - b. Engage an experienced Installer who is certified in writing by the manufacturer listed herein as qualified to install manufacturer's product [or system] in accordance with manufacturer's warranty requirements.
 3. Manufacturer/Supplier Qualifications:
 - a. Firm experienced in successfully producing/supplying products similar to that indicated for this Project, with sufficient production/supply capacity to produce/supply required units without causing delay in the Work.
- B. Regulatory Requirements:
1. In accordance with Specification Section 01-060- Regulatory Requirements, and the following:
 - a. Coating materials and equipment used for this project shall comply with the current application regulations of the California Air Resources Board [CARB] and the Environmental Protection Agency [EPA].
 - b. Regulatory changes may affect the formulation, availability, or use of the specified coatings. Confirm availability of coatings to be used prior to use, and notify the Architect of any recent changes that may have occurred after the preparation of this specification section.
 - c. AISC American Institute of Steel Construction
 - d. AWS American Welding Institute
 - e. SDI Steel Deck Institute
 - f. Tests and Inspection of Shop and field welding shall be in accordance with CBC Section 1705A.2.1 and 1705A.2.5.
 - (1) Perform shop and field welding only under supervision of inspector, by welders recently qualified by Test as prescribed in AWS "Standard Qualifications Procedure", and per CBC Sections 1705A.2.1 and 1705A.2.5.
 - g. When Metal Decking is part of a "listed" deck assembly as indicated on the drawings, provide Metal Decking units listed in Underwriter's Laboratories [UL] "Fire Resistive Directory", or other approved "Fire Resistive Directory" with each deck unit bearing the fire resistive label and marketing for specific system detailed.
- C. Certificates:
1. Provide a letter on Contractor's Letterhead certifying Work provided, meets or exceeds, the requirements of this Section.

1.05 SCHEDULING:

A. Schedule the Work so that there will be no excessive inspection time. At all times that an inspector is required, sufficient work shall be laid out and adequate personnel supplied so that the Inspector's time will be used to full advantage. If inspection costs become excessive because of poor shop procedure, such excess costs will be paid for by the Owner, but deducted from the Contract Price. Poor procedures will be determined upon review of inspection and/or Testing Reports. The rate for charging the excessive costs will be as follows:

1. Minimum of three (3) certified welders are used, Owner will pay 100 percent.
2. Only two (2) certified welders are used, Contractor will be charged 1/3 of the Inspection cost.
3. Only one (1) certified welder is used, the Contractor will be charged 2/3 of the inspection cost.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products specified are from the companies listed below. These products listed herein establish the size, pattern, color range and function selected by the Architect for this Project. Manufacturers listed as acceptable must still comply with the requirements of the products listed in order to be approved as an equivalent during the Submittal Process, the Contractor shall submit product specified.

1. Acceptable manufacturers:
 - a. ASC PROFILES INC.[916]372-6851.
 - b. VERCO MANUFACTURING COMPANY[707]745-9658.

B. Products from other manufacturers not listed must submit in accordance with Specification Section 01-640 - Product Options and Substitutions.

2.02 MATERIALS

A. Metal Deck Units:

1. Steel for Metal Deck Units shall be in accordance with ASTM A 653, grade as indicated on the Structural Drawings and in compliance with SDI specifications.

2.03 ACCESSORIES

A. Miscellaneous steel shapes:

1. Provide in accordance with Specification Section 05-100 - Structural Metal and Metal Fabrications.

B. Shear Connectors:

1. Headed stud type, in accordance with ASTM A 108, grade as indicated on the drawings, cold-finished carbon steel, with dimensions complying with AISC specifications.

C. Sheet Metal Accessories:

1. Provide in accordance with Specification Section 07-600 - Flashing and Sheet Metal, and ASTM A 653, commercial quality, galvanized.

2.04 FABRICATION

- A. Shop Assembly: Form metal deck units in lengths to span a minimum of two or more supports, with flush, telescoped, or nested 2-inch laps at ends and interlocking or nested side laps, of metal thickness, depth and width as indicated.
1. Roof Deck Units:
 - a. Provide deck configurations that comply with SDI “ Specifications and Commentary for Steel Roof Deck”.
 2. Acoustical Roof Decks Units:
 - a. Provide single-pan fluted units with vertical webs perforated with approximately 5/32-inch diameter holes staggered 3/8-inch o.c.
 - (1) Provide mineral fiber acoustical insulation strips of profile to fit void space between vertical ribs; meeting ASTM C 665.
 - or-
 - b. Composite units consisting of upper fluted section combined with lower flat plate section having interlocking side laps and approximate 5/32-inch perforations staggered 3/8-inch centers under cells formed by upper unit.
 - (1) Provide mineral fiber acoustical insulation strips of profile to fit void space of each cell.
 3. Composite Steel Floor Deck Units:
 - a. Fabricate deck units with integral embossing or raised pattern to furnish mechanical bond with concrete slabs. Fabricate open-beam deck units with fluted section having interlocking side laps.
 4. Accessories:
 - a. Metal Cover Plates:
 - (1) Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking.
 - (2) Form to match contour of deck units and approximately 6-inches wide.
 - b. Metal Closure Strips:
 - (1) Fabricate metal closure strips, of cell raceways and openings between decking and other construction, of not less than 0.045-inch (18 gage) sheet steel.
 - (2) Form to provide-tight fitting closures at open ends of cells or flutes and sides of decking.
 - c. Roof Sump Pans:
 - (1) Fabricate from single piece of 0.071-inch (14 gage) minimum galvanized sheet steel with level bottoms and sloping sides to direct water flow to drain.
 - (2) Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3-inches wide.
 - (3) Recess pans not less than 1-1/2 inches below roof deck surface unless otherwise shown or required by deck configuration.
 - (4) Holes for drains shall be cut in the field.
 5. Welding Rods: E60XX Minimum.

2.05 FINISHES

Hot-Dip Galvanizing (both sides of metal deck):

1. Zinc coatings on iron and steel products in accordance with ASTM A 123 “Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products”.
2. Zinc coatings on iron and steel hardware shall be in accordance with ASTM A 153 “Standard Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware”.
3. Galvanized repair paint: High-Zinc-Dust-Content, in accordance with SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight paint for re-galvanizing welds and repair painting galvanized steel.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Site verification of conditions:
1. Prior to the execution of the Work under this specification section, inspect the installed Work executed under other specification sections of this Project Manual which affect the execution of Work under this specification section.
 2. Report unacceptable conditions to the Architect. Do not begin Work until acceptable conditions have been corrected.
 3. Execution of Work under this specification section shall constitute acceptance of existing conditions.

3.02 PREPARATION

- A. Coordination:
1. Coordinate Work under this specification section with Work specified under other specification sections to ensure proper and adequate interface of Metal Decking Work specified under this specification section.
- B. Protection:
1. Protect all adjacent surfaces from drips, spray, welding burns and other damage from Work under this specification section.
- C. Surface preparation:
1. Prepare surface of metal decking for any additional finish as indicated on the drawings in accordance with manufacturer’s instructions and recommendations.

3.03 INSTALLATION

- A. General:
 - 1. In accordance with regulatory requirements.
 - 2. In accordance with manufacturer's instructions and recommendations unless specifically noted otherwise.
 - 3. In accordance with approved shop drawings.
 - 4. Set plumb, level, and square to supports.

- B. Layout:
 - 1. Lines shall be straight and true.
 - 2. Provide one deck unit continuous over three [3] supports, minimum.
 - 3. Abut end joints neatly at center line of support.

- C. Minimum Fastening Requirements:
 - 1. Fasten in accordance with the structural drawings and/or manufacturer's recommendations.
 - 2. Roof Deck Units shall be fastened to resist gross uplift loading per CBC 1609A.5 with minimum of 45 lbs./ft² at eave overhang, and 30 lbs./ft² for other roof areas.

- D. Cutting and Fitting:
 - 1. Cut and neatly fit deck units and accessories around other Work projecting through or adjacent to the decking, and support of other Work shown.
 - 2. Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking, and support of other Work shown.
 - 3. Provide DSA approved hanger slots or clips between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.
 - a. Hanger clips designed to clip over male side lap joints of floor deck units that are approved by DSA may be used instead of hanger slots.
 - b. Locate slots or clips at no more than 14-inches o.c. in both directions, not over 8-inches from walls at ends, and not more than 8-inches from walls at sides, unless otherwise indicated on the drawings.
 - c. Provide manufacturer's standard hanger attachment devices provided they are in accordance with IR 25-2 or IR 25-3, and pre-approved by DSA.

- E. Provide metal joint covers at abutting ends and changes in direction of floor deck units, except where taped joints are required.

- F. Provide roof sump pans over openings provided in roof decking and weld to top decking surface. Space welds not more than 12-inches o.c. with at least one weld at each corner.

- G. Weld shear connectors to supports through decking units as shown on the structural drawings.
 - 1. Do not weld shear connectors through two layers [lapped ends] of decking units.
 - 2. Weld only on clean, dry deck surfaces.

- H. Provide metal closure strips at open uncovered ends and edges of roof decking and in voids between decking and other construction.
 - 1. Weld into position to provide a complete decking installation.

3.04 REPAIR/RESTORATION

- A. After decking installation, wire brush, clean, and paint scarred areas, welds, and rust spots on top and bottom surfaces of decking units and supporting steel members.
 - 1. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.
 - 2. Touch-up painted surfaces with same type of shop paint used on adjacent surfaces.
 - 3. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

3.05 FIELD QUALITY CONTROL

- A. Site tests:
 - 1. As required by regulatory requirements.
 - a. Inspection of installation as per Specification Section 01-410 - Testing Laboratory Services and the DSA "T & I" Inspection List Sheet.
- B. Inspection:
 - 1. As required by regulatory requirements.
 - 2. Schedule inspections and notify the Architect, Owner's Inspector and any regulatory agencies of the time at least 48 hours prior to the inspection.
 - 3. No Work shall be without the inspections required by regulatory requirements.
 - 4. Welding Inspection: Welding of metal deck shall be performed under the inspection of Testing Laboratory. Inspection shall conform to CBC Section 2231A

3.06 CLEANING

- A. Cleaning:
 - 1. Clean in accordance with Specification Section 01-500 - Construction Facilities and Temporary Controls.

END OF SECTION

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to complete all structural carpentry, accessories and other related items necessary to complete the Project as indicated by the Construction Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
03-100	CONCRETE FORMWORK
06-200	FINISH CARPENTRY
07-900	JOINT SEALERS
08-700	FINISH HARDWARE (Finish Hardware Items)
10-050	MISCELLANEOUS SPECIALTIES
10-422	PLASTIC PLAQUES
10-520	FIRE FIGHTING DEVICES
10-800	TOILET ROOM ACCESSORIES

1.03 WORK INSTALLED BUT FURNISHED BY OTHERS:

01-018	OWNER FURNISHED ITEMS
05-100	STRUCTURAL METAL AND METAL FABRICATIONS (Fabricated Metal, Metal Connectors, Hangers, Anchors, Plates, Etc. and Bolts).
08-100	METAL DOORS AND FRAMES (Metal Frames)

1.04 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

FS	Federal Specification
NBS	National Bureau of Standards
RIS	Redwood Inspection Service
WCLIB	West Coast Lumber Inspection Bureau
WWPA	Western Wood Products Association
APA	American Plywood Association
AWPA	American Wood Preservers Association
ALSC	American Lumber Standards Committee

1.05 QUALITY ASSURANCE:

- A. Each Piece of Wood shall have grade stamp in accordance with grades and grading rules designated and as per CBC Section 2303
 - 1. Each pressure treated piece shall bear a stamp of an approved independent agency operating under ALSC overview.

- B. Certify Wood by competent Agency approved by the Architect and the Division of the State Architect.
- C. Each piece of plywood shall have APA grade stamp.
- D. Regrading shall be required where larger, longer members are cut or ripped.

1.06 SUBMITTALS:

Submit Certificates of Compliance to Standards as required by the Architect.

PART 2 - PRODUCTS

2.01 WOOD:

- A. Coast Region Douglas Fir:
 - 1. Standards and Requirements: In accordance with WCLIB “Standard Grading and Dressing Rules” No. 17, WWPA “Standard Grading Rules” 2004.
 - a. All lumber shall be “DRY” and having a moisture content of less than 19 percent at the time of incorporation into the structure, in accordance with WWPA and CBC 2303.1.9.2.
 - b. S4S unless otherwise noted.
 - c. Free of heart center and boxed heart (FOHC), for 4x members and above.
 - d. Wood for joists, rafters and beams: Length of end split shall not exceed 1/2 wide face dimension for 2 x lumber and 1/2 the narrow face for 3 x and thicker lumber.
 - e. Where fire-retardant-treated wood is indicated, pressure impregnate lumber with fire-retardant chemicals to comply with AWPA C20 and CBC 2303.2.8.; identify “fire-retardant- treated wood” with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection, Inc. or other testing and inspecting agency acceptable to DSA/SFM authorities.
 - 1) Provide fire-retardant-treated wood for which a current model code evaluation/research report exists that is acceptable to DSA/SFM authorities having jurisdiction and that evidences compliance of fire-retardant-treated wood for application indicated.

2. GRADING SCHEDULE:

<u>USE</u>	<u>SIZE</u>	<u>GRADE</u>	<u>WCLIB PARA.</u>
Framing	2” to 4” thick 2” to 4” wide	No. 1 or better	124-bb
Framing	2” to 4” thick 6” and wider	No. 1 or better	123-bb
Beams/post	5” and thicker	No. 1 or better	130-bb

<u>USE</u>	<u>SIZE</u>	<u>GRADE</u>	<u>WCLIB PARA.</u>
Posts	5" and thicker width more than 2" greater than thickness	No. 1 or better	130-aa
Posts	5" and thicker width not more than 2" greater than thickness	No. 1 or better	131-bb
Architecturally Exposed Mullions	2-1/4" and thicker 3" and wider	B and Better Industrial Clear conforming to Grade as specified above for framing or posts as determined by size	
T & G Wall and Roof Plank	2" to 4" thick 6" and wider	Commercial Dex	127-c
Boards, sheathing and stripping		Construction	118-b
Sills and Plates	2" to 4" thick 4" and wider	Pressure treated No. 2 Douglas Fir	

B. Plywood:

1. Standard: In accordance with DOC Product Standard PS 1-09, APA Rated and CBC 2303.1.5 unless otherwise noted.
2. Use and Grade:
 - a. Concealed Construction Panels (Wall Sheathing, roof sheathing, parapet sheathing):
 - 1) Span rating as required to suit stud or joist spacing indicated on drawings.
 - 2) Exposure Durability Classification: EXTERIOR.
 - 3) Structural 1 or C-D, group 1. (See drawings)
 - b. Concealed Construction Panels - APA STURD-I-FLOOR (Subflooring or floor sheathing as underlayment):
 - 1) Span rating coordinated to suit joist spacing indicated on drawings.
 - 2) Exposure Durability Classification: EXTERIOR.
 - 3) Structural 1, Group 1, CD plugged T & G.
 - c. Exposed Construction Panels (Backing Panels for electrical or telephone equipment):
 - 1) 3/4" inch thick, minimum.
 - 2) Exposure Durability Classification: EXTERIOR.
 - 3) Fire-Retardant-Treated panels in accordance with AWPA C20 and C27.

3. Machine nailing may be approved as per the drawings with the approval of the Structural Engineer and the DSA.
 - a. The use of machine nailing is subject to a satisfactory jobsite demonstration of each project and the approval by the project Architect or structural engineer and the enforcement agency. The approval is subject to continued satisfactory performance. Machine nailing will not be accepted in 5/16-inch plywood. If nailheads penetrate the outer ply more than would be normal for a hand hammer, or if minimum allowable edge distances are not maintained, the performance will be deemed unsatisfactory.
4. Where fire-retardant-treated plywood is indicated, pressure impregnate plywood with fire-retardant chemicals to comply with CBC 2303.2.8 and AWPA C27; identify "fire-retardant-treated plywood" with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection, Inc. or other testing and inspecting agency acceptable to DSA/SFM authorities.
 - a. Provide fire-retardant-treated plywood for which a current model code evaluation/research report exists that is acceptable to DSA/SFM authorities having jurisdiction and that evidences compliance of fire-retardant-treated wood for application indicated.

2.02 PRESERVATIVES:

- A. Pressure-treat above ground items with EPA approved water-borne preservatives, and in accordance with AWPA U1-14. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent.
- B. Pressure-treat wood members in contact with the ground with EPA approved waterborne preservatives, and in accordance with AWPA U1-14
- C. If items are cut after treatment, coat cut surfaces with two coats of same chemical used for treatment and to comply with AWPA M4-11.

2.03 MISCELLANEOUS MATERIALS:

- A. Nails, screws, bolts, hangers, clips, tie downs, straps and anchors as indicated on drawings for all Rough Carpentry, Glue-Laminated Structural Units except those specifically specified elsewhere.
 1. Nails, Wire, Brads and Staples: ASTM F1667
 2. Wood Screws: ANSI B 18.6.1
 3. Lag Bolts: ANSI B 18.2.1
 4. Bolts: Steel bolts complying with ASTM A 307, Grade C for structural; with ASTM A 563 hex nuts and where indicated, flat washers.
 5. Metal Framing Anchors: Provide metal framing anchors for which manufacturer listed publishes allowable design loads that are determined from empirical data or by rational engineering analysis and that are demonstrated by comprehensible testing performed by a qualified independent testing laboratory acceptable to the Division of the State Architect, Structural Safety Section.
 6. Anchors to be steel sheet zinc-coated by hot dip process on continuous lines prior to fabrication to comply with ASTM A653 for Coating Designation G 185 as standard with manufacturer for type of anchor indicated.

2.04 ALTERNATIVE MATERIALS:

Metal cross bridging: Nailed type only as approved by Architect and DSA may be used in Lieu of wood cross bridging.

2.05 SEALANT PRIMER:

In accordance with Sealant Manufacturer's recommendations.

2.06 JOINT SEALERS:

In accordance with Section 07-900, JOINT SEALERS.

PART 3 - EXECUTION

3.01 ERECTION OF FRAMING:

A. General:

1. All wood shall be accurately cut to lengths required and all joints shall be true and tight fitting. Wood shall be securely nailed, bolted or anchored together in such a manner as to produce a rigid substantial construction.
2. For general notes refer to Drawings.
3. Joists, rafters and beams shall be cut as required to provide a full even and horizontal seating on the support, unless otherwise shown. Do not overcut.
4. Cutting of joists or beams shall be in accordance with the Structural Drawings.

B. At Pipes:

1. General:

- a. Frame to avoid cutting framing for passage of pipes, ducts, and conduit.
- b. Do not cut, notch, or bore framing for passage of pipe, ducts, or conduit without the Architect's approval unless specifically indicated on Drawings.
- c. Pipes shall not pass through plates less than 6 inches wide. Frame stud partitions and space studs to give proper clearance for pipes.

C. At chimneys: Keep all framing 2 inches away from chimney or flues unless otherwise indicated on Drawings.

3.02 APPLICATION OF APA RATED SHEATHING TO FRAMING:

- A. For panels with different veneer face grades, the exposed face shall always be the higher grade, unless otherwise noted on the drawings.
 - 1. When veneered sheathing is used as formwork for concrete, the higher veneer face will be towards the concrete material being formed, unless otherwise noted on the drawings.
- B. Space Sheathing panels 1/8 inch at all edge and end joints unless otherwise noted on the drawings in accordance with APA.
 - 1. APA Rated Sheathing shall be applied with the long dimension or strength axis across the stud framing.
 - 2. Proceed with nailing from the field of the panel first and then to the ends and edges to reduce stressing of the panel surfaces.

3.03 ERECTION OF GLUE-LAMINATED STRUCTURAL UNITS:

- A. Erect glue-laminated structural units in accordance with approved shop drawings, and as noted in Specifications Section 06-180 Glue-Lam Structural Units.
- B. Seal field cuts in accordance with AWWA M4.

3.04 BLOCKING FOR FIXTURES, FLASHING, FINISH HARDWARE ITEMS AND ROOFING PLYWOOD SUBSTRATE:

- A. Provide horizontal blocking as required to properly install and support all elements, fixtures, handrails, toilet partitions, door stops, marker boards and tackboards, cabinet work, wall mounted finish hardware, etc. See also Section also 01-018, OWNER FURNISHED ITEMS for listing of N.I.C. items that will require blocking coordination.
- B. Provide blocking at all plywood edges when plywood substrate (including plywood crickets and parapet wall bracing plywood) is the substrate for roofing materials.
 - 1. Provide blocking (fire retardant blocking when roof system is required to be Class A) at all flashing and edge terminations when required by roofing manufacturer for metal and concrete roof decks.

3.05 FIREBLOCKS:

Fire blocking shall be provided to cut off all horizontal and vertical concealed draft openings in accordance with CBC Section 708.2.

3.06 ATTIC SEPARATIONS:

Provide attic and ceiling area separations in accordance with CBC Section 708.3. Refer to Drawings for details of attic and ceiling area separations above suspended acoustical tile ceiling in metal grids.

3.07 WOOD PROTECTION: (See 2.02)

- A. For Sills and Plates:
1. Located: On concrete and masonry.
 2. Material: Redwood Sills, no treatment required; or Pressure Treated Douglas fir.

3.08 REMOVAL OF DEBRIS:

Remove all Wood, including form lumber, chips, shavings and sawdust in or on the ground from the area inside buildings. Do not bury Wood in fill.

END OF SECTION

FINISH CARPENTRY

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Finish Carpentry, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

08-800 GLASS AND GLAZING

1.03 WORK INSTALLED BUT FURNISHED BY OTHERS:

07-900 CAULKING
08-100 METAL DOORS AND FRAMES (Doors)
08-210 WOOD DOORS
08-700 FINISH HARDWARE
10-800 TOILET ROOM ACCESSORIES

1.04 QUALITY ASSURANCE:

Work shall be the highest standard and performed by skilled workers.

1.05 DELIVERY AND STORAGE:

A. Coordinate and secure materials/products in a timely manner and store properly.

PART 2 - PRODUCTS

2.01 HOLLOW METAL DOORS & FRAMES:

In accordance with section 08-100, Metal Doors and Frames.

2.02 ROUGH HARDWARE:

Nails, screws, bolts, sandpaper, glue and miscellaneous fastening as required for the Work of this Section.

2.03 SEALANTS

In accordance with Section 07-900, Joint Sealers.

PART 3 - EXECUTION

3.01 INSTALLATION OF DOORS, FINISH HARDWARE AND TOILET ACCESSORIES:

- A. Install Doors, Finish Hardware in accordance with manufacturer's instructions.
- B. Doors: Shall be set square, plumb and free.
- C. Finish Hardware: Shall be fitted in place and then removed until the completion of the painting work and then permanently installed in place. Leave free of all paint or damage of any kind, and in fully operating condition.
- D. Toilet Room Accessories: Install in accordance with manufacturer's instructions in the location indicated on the Drawings or as directed by Architect. Install in accordance with California Building code (2022) CBC 11B – 603 and 604.

3.02 INSTALLATION OF CAULKING:

In accordance with Section 07-900, Joint Sealers.

END OF SECTION

MODULAR CABINETWORK

PART 1 - GENERAL

1.01 SCOPE:

Provide materials, labor, equipment and services necessary to furnish and install Modular Cabinetwork, Countertops, accessories and other related items necessary to complete Project as indicated by Construction Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

06-200	FINISH CARPENTRY
09-660	RESILIENT TILE FLOORING
10-050	MISCELLANEOUS SPECIALTIES
DIV.15	MECHANICAL (Plumbing fixtures, including installation)
DIV.16	ELECTRICAL (Electrical fixtures, including installation)

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

WIC	“Architectural Woodwork Standards” Woodwork Institute of California, 2009 edition, including latest amendments
NEMA	National Electrical Manufacturers’ Association, Publication Number LD1, Latest edition

1.04 QUALITY ASSURANCE:

- A. Grades as indicated on the drawings in accordance with the specifications, rules and details for casework of the Woodwork Institute of California’s “North American Architectural Woodwork Standards -3.0” 2016 Edition Design Number System used on Modular Cabinet Schedule). Laminated Plastic Countertops, Splashes, and Wall Paneling.
- B. Manufacturer’s Qualifications: All Cabinet work must be done by WI licensed manufacturers and be able to provide a WI Certified Compliance Certificate for casework.
- C. Acceptable manufacturers or suppliers:
 - 1. Emerzian Woodworking, Fresno, CA (559) 292-2448
 - 2. Inland Showcase Co., Fresno, CA (559) 237-4158
 - 3. Approved equivalent.
- D. 1. Guarantee: 2 Years for all Work

1.05 SUBMITTALS:

- A. Shop Drawings: In accordance with Section 01-300 SUBMITTALS, and AWS Section 8, 10 and Section 11.

- B. Submit 2 copies of Manufacturer's current specifications for Modular Cabinetwork including all types of cabinets and accessories included in this section to the Architect for approval prior to fabrication. Indicate spacing of all hardware accessories for Architect's review of layout.
- C. Submit color samples of Manufacturer's standard range of Laminated Plastic including wood grains to the Architect for color selection prior to fabrication. Color selection to be a minimum of two (2) to six (6) max. colors for high pressure laminate.
- D. Spare Hardware: Provide to District eight of each of the following hardware; Magnetic Catches, Butts, Locks, Pulls, Casters & Change Keys.

1.06 PRODUCT HANDLING:

- A. Delivery: Do not deliver Modular Cabinetwork to the project until notified by the Contractor that the building (or buildings) are in proper condition and arrangements have been made to properly handle, store and protect the cabinetwork.
- B. Replace all Modular Cabinetwork damaged in transit or prior to installation in the project.

1.07 JOB CONDITIONS:

- A. Existing Conditions: Field Measurements - Take and be responsible for field measurements as required. Prior to performing work, report any significant differences between field dimensions and Drawings to Architect.

PART 2 - PRODUCTS

2.01 GRADES AND DEFINITIONS FOR CABINETWORK:

- A. In accordance with AWS Section 10, Style A Frameless, Flush Overlay, Construction Type I or II, and AWS Section 8 & 11 for Countertops, splashes and Wall Paneling.
- B. Definitions:
 - 1. Exposed Portions: Exposed portions of cabinet bodies include all face members of cabinets (cabinet fronts), such as face plates, drawer fronts, door fronts, and exposed shelves with no cabinet doors, and exposed cabinet ends, and exposed cabinet tops and exposed underside of wall cabinets.
 - 2. Semi-Exposed Portions: Semi-exposed members include cabinet divisions, shelves, insides of drawers, and any other cabinet members which can be seen when doors or drawers are open and when standing in a normal upright position.

3. Concealed Portions: concealed members, just as the term implies, include all cabinet framing which cannot be seen when drawers and doors are open and when standing in a normal upright position, such as web frame members, sleepers, dust panels, toe strips covered with resilient base, etc.

2.02 MATERIALS AND FINISH:

- A. Cabinet door and drawer fronts, and any exposed shelves with no door fronts:
 1. Material - Decorative High-Pressure Thermoplastic Laminate, vertical surfacing grade, 0.028" minimum thickness.
- B. Exposed cabinet ends and back panels - In accordance with Paragraph 2.02 A., and shall be loose to the job, scribed to wall to assure tight fit and flush out with face of doors and drawer fronts.
- C. Interior surfaces:
 1. Typical surface:
 - a. Material - High density overlay, 3/4 inch thick Industrial Grade Particle Board Core (44 - 50 lb density), thermal-fused melamine, color as selected by Architect.
 2. Backs and Drawer Bottoms:
 - a. Material - Prefinished hardboard.
 - b. Thickness:
 - 1) Back - 1/2 inches
 - 2) Bottoms - 1/2 inches
 - c. Cabinet backs at sink location shall be removable.
 3. Interior of doors and drawers fronts - in accordance with paragraph 2.02A., finish to match exposed face.
 4. Shelves:
 - a. Material - High density overlay, 3/4 inch thick AB plywood core for spans up to 2'-10", and 1" thick AB plywood core for spans greater than 2'-10", thermal-fused melamine, color as selected by Architect.
 - 1) Library shelving for bookcases will be 1" thick AB Plywood in accordance with WIC Standards, and laminated at both sides and faces with minimum .028" decorative high pressure laminate.
 - 2) Exposed shelves with no door fronts shall be high pressure laminated in accordance with 2.02, A., 1.
 - b. Standard - In accordance with PS 1-83.
 5. Wall Hung Cabinet Bottoms:
 - a. In accordance with 2.02, A., for exposed face finish and 2.02, C, 4. for material thickness, finish and standards.
- D. Edge Banding (visible edges)
 1. Exposed edges : 3mm PVC color to match laminate.
 2. Semi-exposed edges shall be banded with 3 mm Polyvinyl Chloride (PVC), applied with adhesive. PVC color to match exposed surface at shelves, dividers, and partitions.
- E. Countertops, Edges and Splashes.
 1. Surface Material - Decorative high-pressure Thermoplastic Laminate, general purpose grade, 0.050" minimum thickness (0.042" minimum thickness for post forming).

2. Backing Material - Underside of particleboard core shall have a backing sheet securely glued to core.
 3. Front Edge Design - No drip tilt edge at sink counter; use self edge elsewhere.
 4. Back Splash Design - 4 inch integral cove splash, unless otherwise indicated on the drawings.
 5. Core material for tops and splashes - minimum 3/4" thick, Industrial Grade particle board core unless otherwise noted. At sinks use 3/4" thick Exterior grade A-C plywood.
 6. End Splash - 4 inch, unless otherwise indicated on the drawings.
 7. Top of Splash - Square Edge.
 8. Top Strength - 3/16 inch maximum deflection with 150 pound load at mid-span.
 9. Standard - In accordance NEMA standard LD-3
- F. Custom Tops - In accordance with paragraph 2.02 E. and as modified by the drawings.
- G. Epoxy Resin Tops & Splash: Tops shall be molded from modified epoxy resins, non-glare black in color, 1" thick with all exposed front top edges and vertical corners radius 1/4"

2.03 HARDWARE:

- A. Hardware shall be furnished and installed as required to provide a complete casework installation for overlay construction, unless noted otherwise.
- B. Finish: US-26D, unless otherwise noted.
- C. Hardware List:
1. Hinges: Rockford RP-851 (2 3/4- 5 knuckle). 26D for overlay doors.
 2. Pulls: TRIMCO 562-4.
Locks:
 - a. Doors and Drawers - OLYMPUS Lock No. 100 DR & 200 DW respectively.
 - b. Sliding Doors - NATIONAL Lock No. C8142 (3/4");
 - c. Sliding Glass Doors - NATIONAL Lock No. C8140 (1/4").
 4. Drawer Guides: ACCURIDE 2132 with 75 pound capacity.
 5. File Drawers: ACCURIDE 4032, full extension, with 150 pound capacity.
 6. Adjustable Shelf Standard and Support: KNAPE AND VOGT #255 Pilaster Standard #256 shelf support.
 7. Magnetic Catcher: EPCO # 592A.
 8. Wardrobe Clothes Pole: KNAPE AND VOGT #KV660, 1-1/16" O.D. tubing with one #KV734 and KV735 per tube length.
 9. Tote Trays: High impact polystyrene with cardholder, 4-1/4 x 12-3/4 x 18-3/4 inch size.
 10. Hinged Glass Doors: 7/32 inch crystal sheet with 3/4 inch x 1-1/2 inch aluminum frame.
 11. Sliding Glass Doors: 7/32 inch crystal sheet shall have top and bottom metal tracks, KNAPE AND VOGT #1092.
 12. Casters: Casters to be FAULTLESS #BP421-5 and #BP421-5RB, all swivel, 2 non-braking and 2 braking, with non-marking 5 inch diameter rubber wheels, manufacturer's standard finish.
 13. Joint Closure: PEMKO No. 313AN.
 14. Coat Hooks: Wardrobe Hook by IVES, Model #IVSP581A3, cast aluminum.
 15. Exposed Fasteners: When exposed fasteners are used, provide zinc chromate coated oval head, self-tapping phillips screws with grommet finishing washers, same finish as screws.
 16. Cabinet Catch: STANLEY #CD34.
 17. Label Plate: HAFELE #168.01.460

18. Grommets: Mold Rite 3000 Series (decorator colors) at countertop openings as indicated on drawings.
19. Pencil Drawer: U.S. FUTABA # 60111-12-001 (Black).
20. Keyboard Drawer: ACCURIDE 300
21. Bookcart Self-leveling base: self leveling spring system.

2.04 FABRICATION:

- A. Construction: In accordance with AWS Section 10 Plastic Covered Casework, Custom Grade except as amended by these specifications and indicated on the drawings as:
 1. Premium Grade (P) - Construct the same as Custom Grade, except all semi exposed portions behind glass or in open cases and the inside face of hinged cabinet doors shall be faced with 0.028" minimum thickness decorative high pressure thermoplastic laminate of the same material as adjacent exposed face.
 2. Economy Grade (E) amended - Construct the same as Custom Grade except all surfaces shall be faced with 0.020" minimum thickness high-pressure thermoplastic cabinet liner.
 3. Seismic Force Requirements: The types of construction approved by AWS that meet CBC Title 24 seismic force requirements are: Doweled, Confirm at Screws, Fully Plowed-in Back, and Backs Screwed on in rabbeted ends, tops, and bottoms, and Lamello type jointing plates. The exact method for seismic force construction is available from AWS.
- B. Construct openings and backing as required by Work done under Division 15 MECHANICAL (sinks, plumbing, etc.) and Division 16 ELECTRICAL (outlets, switches, wiring, etc.).
- C. Drawers and doors shall be locked, keyed alike in each room and with building masters and grand master. Per Modular Casework Schedule on drawings.
- D. Shelf standards shall be screw applied surface mounted on vertical faces of cabinet. (Drilled shelf support systems are not acceptable!) Shelves will be full widths of openings, flush with inside face of cabinet doors, and dadoed around shelf standards to prevent movement during seismic events.
- E. All base cabinets shall have Plastic Laminate tops constructed in accordance with WIC Section 16 - Laminated Plastic Countertops, Splashes, and Wall Paneling, except as indicated on the drawings.
- F. All doors over 42" high shall have magnetic catches installed @ top and bottom.

PART 3 - EXECUTION

3.01 FIELD MEASUREMENTS:

- A. Dimensions on Modular Cabinetwork Schedule are approximate. Field measurements shall be taken and used in the fabrication of Cabinetwork.
- B. Report any major discrepancy between Schedule and field dimension to Architect.

3.02 INSTALLATION:

- A. Provide experienced, factory trained craftsmen under manufacturer's direct supervision.
- B. Anchor in accordance with drawings and all requirements of CBC.
- C. Set plumb, level, and to true lines as shown.
- D. Filler panels and scribes strips or moldings, as required, shall be properly scribed to adjacent work and securely attached to cabinets as indicated on the drawings.
- E. The entire installation shall present a workmanlike appearance, without open joints, tool marks or other blemishes, and subject to the Architect's approval.

3.03 CLEANING:

Modular Cabinetwork shall be thoroughly cleaned and checked for mechanical operation.

3.04 PROTECTION:

Protect Modular Cabinetwork from damage of any kind.

END OF SECTION

BUILDING INSULATION

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to completely install all Building Insulation, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

06-100 ROUGH CARPENTRY
DIV. 15 MECHANICAL (Duct and Pipe Insulation)

1.03 STANDARDS:

In accordance with 01-080 Codes and Standards and the following:

ASTM American Society for Testing and Materials
NMWIA National Mineral Wool Insulation Association

1.04 QUALITY ASSURANCE:

In accordance with California Quality Standards.

The R values for the insulation materials shall be in accordance with “The Standard for Mineral Wool Building Insulation” latest Edition of the NMWIA.

1.05 DELIVERY AND STORAGE OF MATERIALS:

All materials shall be delivered and stored in original unopened packages with manufacturer’s name and contents legibly indicated. Materials shall be stored in a dry place, and protected from damage.

PART 2 - PRODUCTS

2.01 BLANKET INSULATION:

- A. Construction: In accordance with ASTM C665, low density incombustible fiberglass insulation, (when tested without membrane facing) flame index of 25 or less and smoke developed index of 50 or less: Acceptable manufacturer, “Manville” or equivalent.
1. Type I: Blankets without membrane coverings, used in Interior partitions not subject to moisture.
 2. Type II, Class C: Blankets with a non-reflective vapor-retarder membrane covering one principal face, used in exterior walls or attics subject to moisture conditions but not subject to fire rated conditions. This type of insulation should only be used in conditions not “subject to view” (enclosed cavities) or in attics where a finished ceiling is provided and the attic is not used as a return air plenum.

3. Type III, Class A (Membrane-faced surface with a flame spread of 25 or less and a smoke developed classification no greater than 50): Blankets with a reflective vapor-retarder membrane covering one principal face, used in “exposed-to-view” exterior and interior walls and ceilings or attics subject to moisture and fire rated conditions. This product can be used when the attic (although enclosed by a finished ceiling) is used as a return air plenum.
- B. Thermal Resistance R values required (minimum), unless otherwise indicated on the drawings. Flame Spread Index or Smoke-developed index, Per CBC 720.1
1. Roof Blanket Insulation:R-30.
 2. Wall Blanket Insulation:R-19.
 3. Floor Blanket Insulation:R-30.
 4. Ceiling Blanket Insulation:R-19.
 - a. Attic Spaces: All attic spaces shall have continuous insulation of the proper type and with a minimum thermal resistance “R” value for R-30 for insulation only. Where attic spaces have vertical elements above ceilings, these shall be insulated as part of the attic space to R-30 minimum.
- C. Thickness: No more than will fit into the space available without compressing. Where insulation is confined between finishes which would compress the material, high efficiency insulation shall be used to provide the required resistance value.

2.02 SOUND INSULATION:

- A. Wall Blanket Insulation: Wall Blanket Insulation, per Article 2.01, A., 1.
- B. Sound Deadening Board: 1/2 inch thick Sound Deadening Boarding in accordance with ASTM C208, as manufactured by United States Gypsum, or approved equivalent.

2.03 RIGID INSULATION:

1. Polyisocyanurate foam roofing insulation permanently bonded to fiberglass facers in the foaming process, equal to Sarnatherm Insulation for fully adhered membrane installation. Provide tapered panels as required to provide positive slope to drain, meeting cricket criteria on the Drawings.
2. Weight/density: 2 lbs per cubic foot or approximately 0.17 lbs per square foot.
3. Flamespread: 25(per ASTM E-84)
4. Thickness: as required to provide R=30.
5. Multi-Purpose Building: Provide 2 layers of 2 1/2” thick Rigid Insulation at Standing Seam Metal Roof and Shingle Roof application; to match Z Purlin height. The 2 subject layers are also applicable at Single Ply Roofing Application.

2.04 STAPLES:

Hammer type.

2.05 WIRE:

Sixteen (16) gage line wire.

2.06 ACCESSORIES:

All other materials such as fasteners and retainers not specifically described, but required to complete the work, shall be as recommended by approved manufacturer, and installed by the Contractor.

PART 3 - EXECUTION

3.01 INSTALLATION OF BLANKET INSULATION:

- A. General - All buildings shall have a complete insulation envelope of batts or batts/rigid board roof insulation, unless otherwise noted.
 - 1. Do not install insulation until the construction has progressed to the point that inclement weather will not damage or wet the insulation material.
 - 2. Install in accordance with manufacturer's recommendations.
 - 3. Insulation shall fit snugly between framing members without voids. Fully insulate all areas between all framing members, cutting and fitting as required.
 - 4. Attach insulation to inside face of framing members with Hammer Staples at 6 inches on center with minimum staple penetration of 3/8 inch.
 - 5. Vapor barrier shall be continuous and without unnecessary joints. Overlap vapor barrier at joints. Patch all tears in vapor barrier.
 - 6. Cut and fit insulation material around pipes, conduits and outlet boxes, as necessary to maintain the full integrity of the insulation.
 - 7. Where pipes are located in stud spaces to receive insulation, place insulation between exterior wall and the pipe, compressing insulation if necessary.

- B. At Roof or Ceiling Framing:
 - 1. Install Blanket Insulation between all framing members.
 - 2. At roof framing over 24 inches on center, install line wires perpendicular to framing at 12 inches on center. Attach wire to framing with staples with minimum staple penetration of 5/8 inch.

- C. At Wall Framing: Install blanket insulation between all exterior wall framing members.

- D. At Floor Framing: Install blanket insulation between all floor framing members.

- E. At Ceiling Framing: Install blanket insulation between all ceiling framing members, or lay across suspended ceiling grid in accordance with suspended ceiling manufacturer's recommendations. Block out insulation around light fixtures in accordance with CEC.

- F. Sound Insulation:
 - 1. Install Blanket Insulation per Part 3.01 above.
 - 2. Install Blanket Insulation between ceiling framing members as indicated on the Drawing, or laid across the suspended ceiling members in accordance with ceiling manufacturer's recommendations.
 - 3. Install Sound Deadening Board at interior walls as shown on the drawings.

- G. Draft Stop Insulation:
 - 1. Install Draft Stop Insulation of locations shown on drawings.

3.02 **INSTALLATION OF RIGID INSULATION:**

Install all roofing components in accord with the manufacturer's recommendations to achieve the design intent and configuration shown on the Drawings.

1. Roof Insulation and tapered insulation panels shall be laid out as indicated on the approved shop drawings to provide a uniform slope to drains. Secure mechanically to roof deck with approved fasteners in quantity and spacing as recommended by the insulation manufacturer for each panel.
2. Fasteners shall have surface plates and be of sufficient length to penetrate a minimum of 1" through the roof deck. Provide # 15 screws XPN @ 6" o.c. at laps & walls.
3. Where required, filler insulation panels shall be installed below the tapered panels where required to maintain a continuing slope.
4. Multiple layers for crickets shall be adhesively applied.

END OF SECTION

FIBERGLASS SHINGLE ROOFING SYSTEM
SBS MODIFIED

PART 1 - GENERAL

1.01 Scope of Work

- A. Provide all material, labor, equipment and services to remove all existing roofing materials where specified and furnish and install a Class A certified laminated fiberglass shingle 50 yr. roofing system including accessories and other related items necessary to complete the projects as indicated by the Contract Documents unless specifically excluded.

1.02 Quality Assurance:

A. Contractor Qualifications

1. Contractor shall be approved by the manufacturer as a qualified applicator.
2. Contractor shall have a minimum of five (5) years experience in the installation of composition shingles.
3. Contractor shall be acceptable to District, Architect and roofing material supplier.
4. Contractor shall provide list of at least ten (10) projects available for inspection employing similar system within the last three years.
5. Contractor shall be responsible for obtaining all data required from roofing material manufacturer. These specifications are generically based on minimum performance qualifications of both the contractor and the roof system manufacturer. Contractor shall be responsible to provide submittal evidence in compliance with all requirements of Section 07510fgs.
6. State Contractor's license required: Class C-39
7. Failure to meet any part of all of these requirements may result in the rejection of the bidders proposal. The district has the right to waive any of the above requirements.

B. Roofing material manufacturer will:

1. Meet all the requirements for membership with the National Roofing Contractors' Association (NRCA)
2. Be nationally recognized in roofing and waterproofing industry for at least ten (10) years.
3. Provide employee as Field Representative to inspect the project at each phase of the installation. A written report of each visit will be made and a copy given to the District within five (5) days of the visit. The report will include comments on quality of work, problems noted, overall job progress, etc. Representative will be authorized to make decisions on behalf of material manufacturer.
4. Provide list of at least ten (10) projects available for inspection employing similar roofing system within 100-mile radius and same climate zone of

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- project building.
- 5. Be approved by District /Architect.
- 6. Provide District proof/copy of material product liability insurance for minimum five million dollars covering all major roofing components listed in Part 2, Products.
- 7. The presence and activity of the manufacturer's representative and/or District representative shall in no way relieve the contractor of his contractual responsibilities.

1.03 Warranty

- A. Contractor's warranty: Upon project completion and acceptance, the contractor shall issue in writing to the District a labor and workmanship warranty for a period of not less than five (5) years. The product/material manufacturer shall issue in writing a standard material/product warranty for a period of not less than Fifty (50) years.
- B. Manufacturer's warranty: Manufacturer will issue a 10-year non-prorated NDL (no dollar limit) full-system warranty which covers defects in materials and labor for installation.
- C. Warranty Service: Contractor must be capable of responding to emergency roof leaks within two (2) hours of notification by District.

PART 2 - PRODUCTS

2.01 Laminated Fiberglass Shingles, SBS modified

- A. Shingles must meet or exceed the following technical data as tested by an approved roofing material testing laboratory. Approved products are Legacy by Malarkey Roofing Company and StormMaster LM50 by Atlas Roofing Corporation and IKO Grandeur.

1. Tear strength	ASTM D3462	Min. 2,000
2. Impact resistance	UL 2218	Class 4
3. Wind resistance	UL 997, ASTM D 3161	100 mph
4. Fire rating	UL 790, ASTM E 108	Class A

- B. Ridge Shingles
 - 1. Low-profile hip and ridge
- C. Starter Shingles
 - 1. 7" wide with self-sealing adhesive strip

2.02 Underlayment

- A. Type IV, 100 cm (39.37 inches) wide, SBS modified fiberglass- reinforced underlayment, complying with ASTM D 226, 37.5 pounds per square, Layfast underlayment TU-35 as manufactured by MB Technology, Malarkey 501-UDL or approved equal.

2.03 Metal Products

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- A. Flashings:
 - 1. Edge Metal: 24 gage galvanized, 3"x3" or to fit field conditions, with ½" drip edge and 3/8" hem. Cut to form 3" interlocking joints.
 - 2. Step Shingle: 24 gage galvanized, 6" x 4" x 10".
 - 3. Valley: 24 gage galvanized, 16" minimum width
 - 4. Roof jacks: 26 gage galvanized
 - 5. Gutters and downpours: job specific

- 2.04 Deck Vents
 - A. Eyebrow Vents: Simpson low profile (49 square inches free air)

- 2.05 Miscellaneous
 - A. Roofing nails - hot dipped galvanized, sharp point barbed, 11 to 12 gauge with 7/16" diameter head and 1 1/4" in length unless otherwise specified to provide minimum deck penetration of 3/4". Staples or other type fastening methods are not acceptable. Use 4 fasteners per shingle.

 - B. SBS: Peel and stick. RUFTAK made by Henry Co. or ST40 made by MB Technology. Self-stick with minimum thickness of 40 mils.

 - C. Caulking: Polyurethane: Vulkem 116 made by Mameco Intl. or Sonolast NP-1 made by Sonneborn Building Products.

PART 3 - EXECUTION

- 3.01 Installation
 - A. General: Comply with manufacturer's instructions and recommendations but not less than those recommended by the NRCA Steep Roofing Manual.

 - B. Underlayment
 - 1. Apply 1 layer of SBS shingle underlayment per manufacturer's recommendations. Slope roofs under 3:12 pitch require an additional layer of underlayment. Shingles that have less than 1" overlap at the nailing strip will provide two layers of the specified underlayment.
 - 2. Roof valleys: Install 36" width SBS peel & stick waterproofing material in all valleys before applying shingle underlayment.

 - C. Shingle Application:
 - 1. Install starter shingles with adhesive strip to prevent wind uplift
 - 2. Install new shingle roof in accordance with these specifications and manufacturer's recommendations.
 - 3. Use vertical and horizontal chalk lines to ensure straight coursing.
 - 4. Cut and fit shingle at valley, ridges, and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap shingles at ridges to shed water away from direction of prevailing wind.

 - D. Roof jacks
 - 1. Deck jacks must fit properly without cutting or trimming

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2. Set flange in bed of polyurethane sealant.
 3. Seal at penetration point with polyurethane caulk
 4. Slip sheet: Install slip-sheet to go under first layer of underlayment and over flange of jack.
 5. Exposed flange: Attach with pointed screws @12" o.c. with caulk or neoprene washers.
- E. Flashings
1. Step flashing shall be installed with 5" overlap.
 2. Install saddles (cricket high side if over 24"), skirt and step flashing around mechanical equipment as per roof plans and/or job walk.
 3. Valley metal shall be installed using flathead grabber screws. Install metal over 1- layer of SBS peel and stick water barrier. Extend peel and stick 6" beyond metal. Stagger screws @ 9" o.c. Shingles must be cut at the valleys. Provide minimum of 4" overlap.
 4. Install field-soldered lead jacks around conduits, which penetrate the side of equipment platform.
- F. Edge Metal:
1. Install new perimeter metal using Vulkem 116 caulking at joints with at least 3" overlap in accordance with manufacturers recommendations.
 2. Nail pattern: 8" to 10" o.c. staggered.
 3. No joints shall buck water.
- G. Deck Vents:
1. Simpson low-profile vents (49 square inches free air) to be located about 12" below ridgeline. Spacing is job specific. Cut deck and provide blocking if necessary for support. Refer to section 3.01 (D) for installation procedure.
- H. Conduit blocking
1. Single conduit 2" and under
 - a. Minimum size 2 x 4 x 8" treated douglas fir or redwood with unistrut. Attach using 24-gage g.i. strap fastened to bottom of block and to the deck under shingle tab.
 2. Multiple conduit systems or conduits larger than 2" (job specific)
- I. Platforms
1. Security dividers: Install 2x4's or 1/8" x 1" flat metal @ 6" o.c. to prevent entry into building where deck openings are larger than 12" x 12".
 2. Vapor barrier: Install self-adhering vapor barrier over wood platform (Ruftak) by Henry Co. or approved equal) before installing metal cap.

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3.02 Clean up

On a daily basis, project site shall be kept clear of waste and debris. Waste shall be removed from site promptly to prevent an unsafe or unsightly build-up.

METAL PANELS

PART 1 - GENERAL:

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to completely install Metal Panels, accessories and other related items necessary to complete the Project as indicated by the Contract Documents, unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
03-300	CAST-IN-PLACE CONCRETE
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
07-600	FLASHING AND SHEET METAL

1.03 STANDARDS:

In accordance with Section 01-080 Codes and Standards and the following:

AISC American Institute of Steel Construction

1.04 SUBMITTALS:

- A. Product Data: In accordance with Section 01-300 Product Submittals
- B. Shop Drawings: In accordance with Section 01-300 Product Submittals
- C. Samples: In accordance with Section 01-300 Product Submittals
- D. Colors: In accordance with Section 01-300 Product Submittals

1.05 GUARANTEE:

In accordance with Section 01-740, Guarantees

PART 2 - PRODUCTS

2.01 METAL PANELS:

- A. Materials and Finish:
 - 1. Sheets: ASTM A653 and ASTM A755, Grade 37 for Structural Quality sheet material; before forming, chemically clean, then hot-dip zinc coating to G-90 thickness per ASTM A792. Next apply flexibilized epoxy base coat primer to a total dry film thickness of 2 mils (+/-) 0.05 mil. Final color coating shall be:
 - a. FLURO FINISH: KYNAR 500 color coat, minimum dry film thickness of 0.8 mil. Color coat to be selected by Architect from manufacturer's full line of Prismatic Colors
 - b. Color coat shall be applied to one side typically; **where both sides are exposed to view or the weather, both sides shall be factory finished.**

- B. Metal Panels: (Roofing, Siding & Misc.)
1. Building Panels (Metal Panels):
 - a. Design: Pre-finished Sheet Metal (flat coil) Panels by GARLAND CO./CENTRIA
 - b. Material: 20 gage galvanized steel.
 - c. System:
 - d. Profile:
 - e. Finish: See 2.01, A. of this section.
 2. (Type "D") Siding / Roofing Panels:
 - a. Design: "BR5-36" Steel Profiled Panels by **CENTRIA**; GARLAND COR Box Rib.
 - b. Material: 20 gage galvanized steel - locations shown on drawings.
 - c. System: Ribbed Line at 7.2 inches o.c. (36" panel width)
 - d. Profile: 1-1/2" deep Box Rib. (**Inverted at roof panel condition**)
 - e. Finish: See 2.01, A. of this section.
 3. (Type "E") Standing Seam Roof Panels:
 - a. Design: R-MER SPAN Roofing Panels by GARLAND CO.; CENTRIA SRS-3.
 - b. Material: 24 gage galvanized steel.
 - c. System: R-MER SPAN – **18" wide seam panels (full length)**
 - d. Profile: 2 3/8 inch high standing seam.
 - e. Finish: See 2.01, A. of this section
- C. Interior Panels: NOT APPLICABLE
1. Liner Panels:
 - a. Design: L-21A Liner Panel by Inryco (H.H. Robertson Company).
 - b. Material: 20 gage galvanized steel - locations shown on drawings.
 - c. System: Perforated panels per manufacturer's standard.
 - d. Profile: 1-1/2" deep x 24" wide liner sheets with four (4) rolled dimples per panel.
 - e. Finish: Galvanized with polyester/acrylic prime cost (PPG Duracon or approved equivalent).
- D. Subgirts: Roll formed from metal coated steel into the required shape to properly receive all panel fasteners and produce the combined action between the face sheet and the liner to meet the designated design loads and deflections.
- E. Insulation: N.A
- F. Trim, Gutter, Flashing, all Misc. Closure and Filler Shapes in contact with pre-finished metal Panels. All trim pieces shall have self-hemmed edges fully finished. No raw or painted cut-edges will be permitted.
- G. Fasteners: Self tapping screws, #12 stainless steel TEKS with pre-painted heads and neoprene washer.
 1. Provide stainless steel bolts of size and spacing as indicated on the drawings. Paint heads to match adjacent panel color.
 2. Conceal Anchor Clips (standing seam roofing) 16 ga. G-90 galv. steel.
- H. Vapor Barrier: Shall be self-adhered roofing underlayment for high temperature applications GRACE ICE & WATER SHIELD HT as manufactured by W.R. GRACE & CO. Install over plywood sheathing per manufacturer recommendations; per ASTM E108/UL790.

2.02 SEALANT:

- A. In accordance with Section 07-900 Joint Sealers.
- B. Type
 - 1. At Vapor Retarder: Mastic
 - 2. At Water Seal: Thiokol

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Prior to installation of Metal Panels, inspect the installed Work executed under other Sections which affect the installation of Metal Panels. Alignment of Structural Steel shall be within the tolerances set up by AISC.
- B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been corrected.
- C. Installation of Metal Panels shall constitute acceptance of existing conditions.

3.02 COORDINATION:

Coordinate metal panels work with related items specified under other Sections to ensure proper and adequate interface of Work.

3.03 ERECTION:

- A. In accordance with approval shop drawings and manufacturer's recommendations over continuous vapor retarder.
 - 1. Lap vapor retarder joints 6 inches and mechanically attach the vapor retarder in accordance with manufacturer's recommendations compatible with warranty requirements.
- B. Panels shall be plumb and true.
- C. Use full length panels with seams located only where shown on the drawings.
- D. Field mitered joints shall be neat, true to line and water tight.
- E. Fastening:
 - 1. Typical: In accordance with approved shop drawings and manufacturer's recommendations.
 - 2. Seal all side joints with 1/8 inch x 3/8 inch caulking bead.

3.04 CLEANING:

In accordance with Section 01-700, Cleaning.

END OF SECTION

SINGLE-PLY MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this Section.

1.2 SUMMARY

- A. Section includes a **mechanically attached Sure-Weld 80 mil TPO single ply roofing system**.
- B. Related Work Specified Elsewhere:
 - 1. Selective Demolition: Section 02-115.
 - 2. Rough Carpentry: Section 06-100.
 - 3. Flashing Sheet and Metal: Section 07-600.
 - 4. Roof Hatch: Section 07-830.

1.3 SUBMITTALS

- A. Product Data: Provide manufacturer's technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements. Samples: Submit two (2) samples of the following:
 - 1. Membrane
 - 2. Fasteners
 - 3. Insulation
- B. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.
- C. Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7-10, In no case shall the design loads be taken to be less than those detailed in Design and Performance Criteria article of this specification.
- D. Certificates: Cool Roofing certified by Cool Roof Rating Council.
- E. Shop Drawings: For roofing system. Include plans, elevations, sections, details and attachments to other Work.
- F. Samples: If specifically requested for specified products; required for alternate products.
- G. Installer Qualifications: Provide evidence that installers meet the requirements of Article 1.4.
- H. Submittals:

1. O & M Manuals: Maintenance instructions.
2. Guarantee: Provide completed form per Article 1.5.
3. Manufacturer's weekly inspection reports noting issues, corrections, and final inspection photos.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:

1. Minimum of 5 years of experience on similar work; knowledge and understanding of standards referenced herein; skill necessary to perform in compliance with this specification. Installers failing to demonstrate the required experience, knowledge, or skill shall be removed from the project.
2. Factory trained and approved applicator.
3. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress. Maintain proper supervision of workmen.
4. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.

B. Testing Characteristics: UL Class A roof; UL-580 Class 90 wind uplift.

C. Applicator-Manufacturer Review: Provide Drawings and Specifications review by Applicator with agent of roofing manufacturer; obtain manufacturer's agreement that specified system is proper for application shown.

D. Manufacturers Participation:

1. Pre-Application Job-Site Conference: Arranged by Applicator, with a minimum of 1 week advance notice; for review of storage, handling, protection, surface preparation, materials and application specifications; attended by applicator, his foreman, Architect, inspector, and manufacturer's agent.
2. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program.
3. When the Project is in progress, the roofing system manufacturer will provide the following:
 - a. Report progress and quality of the work as observed.
 - b. Provide job site inspections a minimum of two (2) days a week throughout the course of construction.
 - c. Provide electronic inspection reports submitted weekly to the Owner and/or Architect.
 - d. Report to the Architect and/or Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
 - e. Confirm after completion that manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.5 WARRANTY

- A. Manufacturer: Provide 30 year limited warranty on manufacturers form. Warranty shall period shall begin on date of acceptance of roofing by Owner.
- B. Manufacturer will provide the following services at years 2, 5, 10, 15, and 20 at no cost to the owner.
 - 1. Inspection by a technical service representative and delivery of a written inspection report documenting roof conditions.
- C. Provide one warranty by a single approved manufacturer.
- D. Installer: Provide two (2) years warranty from date of acceptance by Owner.
- E. Leak responsibilities from the manufacturer to the owner in the event a roof leak should occur.
 - 1. Provide a toll free (800) number for owner to call in leak report. Number will be monitored (24) hours per day (365) days per year.
 - 2. Provide a response to owner within (24) hours of when call is made.
 - 3. Provide a repair crew, at the building site, within two (2) business days of the call.
 - 4. Provide follow up inspection to ensure repairs were completed properly.

PART 2 - PRODUCTS

2.1 SINGLE-PLY ROOFING

- A. Acceptable Products:
 - 1. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this section.
 - 2. The design is based upon roofing systems by CARLISLE SYNTEC SYSTEMS.
 - a. Sure-Weld TPO 80 Membrane (ASTM D 751)
 - b. Membrane Thickness: (ASTM D 751) 80 mil nominal.
 - c. Breaking Strength (ASTM D 751): 350 lbf/in
 - d. Tearing Strength (ASTM D 751): 130 lbf/in
 - e. Factory Seam Strength (ASTM D 751) 66
 - f. Puncture Resistance (FTMS 101 C) 450 lbs.

- B. **Acceptable Manufacturers: FIRESTONE, “Ultraply TPO Platinum 80 Mil Membrane System”** or Owner and Architect Approved Equal.

2.2 UNDERLAYMENT

- A. Slip Sheet: N/A

2.3 NAILERS

- A. Douglas Fir; No. 2 or better, pressure treated; no creosote or asphalt preservatives allowed.

2.4 ROOF BOARD INSULATION

- A. Roof Insulation base layer 4' x 8' max dimension: Hunter Insulation Panels or equal, (ASTM C 1289) polyisocyanurate rigid insulation board: Not Applicable
1. Thickness: N/A
 2. R-Factor: N/A
 3. Attachment Method: N/A
- B. Roof Insulation top layer: Dens Dek or equal roof board 4' x 8' max dimension.
1. Thickness: ¼”inch or ½” for Roofing Manufacturer 30 year warranty.
 2. Attachment Method: Mechanically fastened, 6 fasteners per sheet.
- C. Tapered Insulation: Tapered Hunter Panels or equal insulation board to be used as required for tapered insulation system: Not Applicable
1. Field Slope: N/A inch per foot.
 2. Sump Slope: N/A inch per foot.
 3. Cricket Slope: N/A inch per foot.
 4. Attachment Method: N/A

2.5 FASTENERS

- A. Heavy duty HPX threaded fastener with PIRANHA Fastening Plate to secure Mechanically Fastened Roofing Systems. It is used on minimum 22 gauge steel decks or minimum 15/32" CDX plywood decks. It is also designed to offer an optimum combination of driving performance, back-out and corrosion resistance with excellent pullout performance.

- B. Fastening Plate: A 2-3/8" diameter metal barbed fastening plate used with HP-X, CD-10 or HD 14-10 Fasteners for membrane or insulation securement. This plate can be used for membrane or insulation securement on Mechanically Fastened Roofing Systems.
- C. Insulation Fastening Plate: A nominal 3-inch metal plate used for insulation attachment in conjunction with the appropriate fastener.
- D. Nails: SFS 2-1/4 inch long wood deck fastener with domed convex stress plate, or No. 14 1-5/8 inch long fastener with 2 inch round metal barbed stress plate.

2.6 ACCESSORIES

- A. Sure-Weld 80 membrane shall be used for all flashing requirements to match the field membrane and warranty expectations selected for the roofing system.
- B. Sure-Weld Inside Corners: Pre-molded corner flashing for inside corners. 80 mil thickness. Color - White.
- C. Sure-Weld Outside Corners: Pre-molded corner flashing for outside corners. 80 mil thickness. Color - White.
- D. Sure-Weld T-Joint Covers: 40 mil thick non-reinforced PVC flashing cut into a 4.5 inch (114mm) diameter circle used to seal step-offs at splice intersections.
- E. Sure-Weld Pipe Flashings: A pre-molded flashing and clamping ring used for pipe penetrations. Available for 1 inch to 6 inch (25 - 152mm) diameter pipes.
- F. Sure-Weld Split Pipe Seals: Pre-fabricated flashing consisting of 80 mil reinforced Membrane for pipes 1 inch to 6 inch (25 - 152mm) in diameter. A split (cut) and overlap tab are incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration.
- G. Sure-Weld Non-Reinforced Flashing: 80 mil thick rolls 12 inches and 24 inches wide. Used for inside/outside corners and field fabricated pipe flashings when use of pre-molded accessories is not feasible.
- H. Sure-Weld Heat Weldable Walkway Rolls: offering superior tear, puncture and weather resistance and designed to protect membrane in those areas exposed to repetitive foot traffic or other hazards. Walkway material may be heat welded to membrane using an automated heat welder or hand held heat welder. Walkway Rolls are 36 inches (914mm) wide by 60 feet (18.3 M) long and are nominal 80 mils thick.
- I. Single ply Coated Sheet Metal: Provide where flashing, gravel stops and sheet metal are in contact with Single -ply roofing membrane.

2.7 SOLVENT, SEALANT, AND ADHESIVES

- A. As recommended by manufacturer.
- B. Carlisle Low-voc Bonding Adhesive #1168: Solvent-based contact adhesive that allows bonding of membrane to various porous and non-porous substrates.
 - 1. Base: Synthetic Rubber
 - 2. Color: Pale Yellow

- C. Carlisle Universal single-ply sealant
 - 1. Solvent free, one part, polyether sealant for weather tight seal for Sure-Weld Roofing Systems.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- D. Do not commence Work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Do not apply wet roofing, on wet application surface, or when temperature of deck less than 50 degrees F.
- B. Provide entire roof system including treated wood nailers, Single-ply coated sheet metal, and coordination of items such as roof drains, sumps, jacks, etc.
- C. Protect adjoining materials from stains particularly around perimeter of building; prevent debris from clogging roof drains.
- D. Deck surface swept clean and dry; keep free of loose and foreign materials.

3.3 INSTALLATION

- A. Install in conformance with referenced standards, manufacturer's written directions, as shown, and as specified.
 - 1. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically if multiple layers are provided.
 - 2. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.
 - 3. Securely attach insulation to the roof deck for Adhered or Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by Factory Mutual (FM I-90) & the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

- B. Application; Mechanically attached system over roof deck.
1. It will be the responsibility of the roofing contractor to initiate and maintain a QC program to govern all aspects of the installation of the Roofing System.
 2. The project foreman and or supervisor will be responsible for the daily execution of the QC program which will include but is not limited to the supervision, inspection and probing of all heat welding incorporated within the Roofing System.
 3. If inconsistencies in the quality of the application of the composite, membrane and/or welds are found, all work shall cease until corrective actions are taken to ensure the continuity the installation.
 4. Unroll and position membrane without stretching. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
 5. Secure the membrane with the required fasteners and plates centered over the pre-printed marks approximately 1 1/2 inches (39mm) from the edge of the membrane sheet.
 6. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's current application requirements.
 7. Attachment Schedule:
 1. Field (Zone 1) Fastener Density: 12 inches on center
 2. Perimeter (Zones 2 and 3) Fastener Density: 6 inches on center
 3. Perimeter (Half-width) Sheets: 2
 8. Parapet Wall Covering: Install as shown, extend to full height of parapet; lap under parapet cap flashing and over wall substrate 2 inches minimum on the back side of the wall. Secure in place 9" on center on the outside face to assure a completely watertight installation.
 9. Walkway: Per manufacturer's instructions and as shown on drawings. If drawings do not show walkways a minimum of all sides at all mechanical equipment will have walkway installed as well as at all doorways and ladders.
- C. Fasteners:
1. General: Per manufacturer's recommendation; fastening length and pattern based on performance values supplied by the fastener/disc manufacturer and conforming to Factory Mutual I-90 fastening pattern.
 2. Walkway Fastening: Provide 2 inch continuous heat weld strip around perimeter of membrane.
- D. Hot Air Welding
1. All field seams exceeding 10 feet in length shall be welded with an approved automatic welder.
 2. All field seams must be clean and dry prior to initiating any field welding.
 3. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone or authorized alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. **Do not use denim or synthetic rags for cleaning.**

4. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
5. Contaminated areas within a seam will inhibit proper welding and will require a membrane patch

E. Hand Welding

1. The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place.
2. The back "interior" edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
3. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inches in width.
4. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1 inch weld.

F. Automatic Machine Welding

1. Follow all manufacturers' instructions for the safe operation of the automatic welder.
2. Follow local code requirements for electric supply, grounding and surge protection.
3. The use of a dedicated, portable generator is highly recommended to ensure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
4. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inches in width.

G. Inspection

1. The job foreman and/or supervisor shall initiate daily inspections of all completed work which shall include, but is not limited to the probing of all field welding with a dull pointed instrument to assure the quality of the application and ensure that any equipment or operator deficiencies are immediately resolved.
2. Ensure that all aspects of the installation (sheet layout, attachment, welding, flashing details, etc.) are in strict accordance with the most current WeldTite Roofing Systems Specifications and Details.
3. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of FINAL INSPECTION FOR WARRANTY ACCEPTANCE.

- H. Metal Flashings:
1. General: Fabricate and install per Section 07.... - FLASHING AND SHEET METAL, as shown and per manufacturer's recommendations. Install PVC coated metal flashing at intersections of roofs with sloped or vertical surfaces, roof interruptions and penetrations.
 2. Base Flashing: Extend up vertical surfaces 6 inches, minimum, and onto the horizontal roof surfaces not less than 3 inches, unless otherwise noted. Provide PVC coated metal flashing with 2 inches minimum overlap of roofing membrane; heat weld in the horizontal plane, with subsequent sealing of seams with sealant.
 3. All perimeter edge details are to be fabricated from WeldTite Clad Metal.
 4. Ensure all fascia extend a minimum of 2 inch lower than the bottom of the wood nailers.
 5. Fasten all metal flashing to wood nailers or approved substrate with approved fasteners 8 inches on center.
 6. Break and install WeldTite Clad metal in accordance with approved details, ensuring proper attachment, maintaining 1/2 inch expansion joints and the installation of a minimum 2 inch bond breaker tape prior to sealing the joint.
 7. Solidly weld WeldTite Clad expansion joints with a 6 inch strip of Solar Bright membrane welded to the WeldTite Clad, covering the bond breaker tape (cover plates are optional).
- I. Roof Drains
1. Flash all roof drains in accordance with WeldTite roof drain details.
 2. Replace all worn or broken parts that may cut the WeldTite membrane or prevent a watertight seal. This includes the clamping ring and strainer basket.
 3. Replace all drain bolts or clamps used to hold the drain compression ring to the drain bowl.
 4. WeldTite non-reinforced 80 mil membrane shall be used for flashing the drain assembly. Drain assemblies and basins or "sumps" must be free of any asphalt or coal tar pitch residue prior to installation.
 5. The drain target sheet should be sized and installed to provide for a minimum of 12 inch of exposed 80 mil on all sides of the drain.

3.4 FIELD QUALITY CONTROL

- A. Perform field inspection and testing as required under provisions of Division 01 Section Quality Requirements & manufacturers recommendations.
- B. Heat weld test cuts will be required. One (1) test cut per 5,000 square feet will be required.
- C. Correct defects or irregularities discovered during field inspection.
- D. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system a minimum of two (2) days per week. A copy of the specification should also be on site at all times.

3.5 CLEANING

- A. Keep premises free from accumulation of waste and debris. At completion of installation remove surplus materials and debris.
- B. At completion clean exposed surfaces in a manner that will not damage finish.

3.6 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.
- B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. The roofing system manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the Roofing Contractor.
- D. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas at his own expense.
- E. Repair or replace deteriorated or defective work found at time above inspection as required to produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements
- F. Notify the Contractor, Architect, & Owner upon completion of corrections.
- G. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

END OF SECTION

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to finish and install Flashing and Sheet Metal, accessories and other related items necessary to complete the project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

05-100	STRUCTURAL METAL AND METAL FABRICATIONS
06-100	ROUGH CARPENTRY
08-100	METAL DOORS AND FRAMES
09-900	PAINTING
DIV. 15	MECHANICAL
DIV. 16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

LIA	Lead Industries Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, latest Edition, Architectural Sheet Metal Manual.
USASI	United States of America Standards Institute

1.04 QUALITY ASSURANCE:

- A. Work shall be in accordance with Standards and details set forth in latest edition of the SMACNA Manual and Specifications unless indicated otherwise.
- B. The schedule for roofing penetrations at the end of this section and the details contained within the drawings are minimum standards required for this project. The roofing manufacturer and installer shall select the roof flashing material and detailing for compatibility with roof system and warranty required.

1.05 SUBMITTALS:

- A. Submit Shop Drawings in accordance with 01-300 Submittals.
- B. Submit Warranty.

1.06 WARRANTY:

- A. In accordance with 01-740 WARRANTIES.
- B. Warranty Period: Five years.

PART 2 - PRODUCTS

2.01 FLASHING AND SHEET METAL:

A. ZINC-COATED SHEET METAL AND FLASHING

1. Commercial quality with 0.20 percent copper, ASTM A 653, G-90 hot-dip galvanized, mill phosphatized where indicated for painting; 0.0359 inch thick (20 gage) minimum except as otherwise indicated.

B. LEAD FLASHING (If Applicable)

1. ASTM B 749, Type L51121, copper-bearing sheet lead, minimum 4 lb/sq. ft. (0.0625 inch thick) minimum for burning (welding) unless otherwise indicated.

C. SHEET ALUMINUM (If Applicable)

1. Provide sheet aluminum in accordance with ASTM B 209, alloy 3003, temper H14, AA-C22A41 clear anodized finish.
 - a. Gage 0.063 inches.
 - b. Prepare anodized finish for application of primer and finish coats as indicated on the drawings.

2.02 SOLDER AND FLUX:

- A. Solder: Shall be 50% tin and 50% lead in accordance with ASTM B 32. All flux used for galvanized iron or steel shall be rosin flux.

2.03 PAINT (If applicable):

- A. Pre Treatment Primer: "Sinclair" #7113 or approved equivalent.
- B. Galvanized Metal Primer: "Sinclair" #14 or approved equivalent.

2.04 SEALANTS:

- A. Plastic Cement: Bituminous Plastic Cement or equal.
- B. Flashing Compound: In accordance with roofing manufacturer's recommendations, compatible with roofing warranties.
- C. Sealants: Shall be in accordance with Section 07-900 JOINT SEALERS, Type 3-Polysulfide.

2.05 ELECTROLYTIC INSULATION:

Shall be asphalt impregnated felt, asphaltum paint, neoprene or EPDM rubber.

2.06 FABRICATION:

- A. Workmanship: Surface and lines shall be true and free of kinks and buckles.
- B. Joints in Galvanized Sheet Metal shall be soldered as required with solder and acid flux in a strong secure manner.
- C. Shop Finish: All exterior galvanized sheet metal, unless specified otherwise, shall have all surfaces, except surfaces receiving roofing felt, painted with one coat Pre-Treatment Primer followed by one coat Galvanized Metal Primer prior to installation.

2.07 FASTENERS:

- A. Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer or roofing manufacturer. Match finish of exposed heads with material being fastened.

PART 3 - EXECUTION

3.01 INSTALLATION OF FLASHING AND SHEET METAL:

- A. Install in accordance with Standards and Details set forth in SMACNA Manual and Specifications unless indicated otherwise.
- B. Structurally reinforce and anchor work as required.
- C. Work shall be weather and water tight as required.
- D. Where dissimilar metals come into surface contact, cover surface in contact with electrolytic insulation.
- E. All gravel stops shall be installed in accordance with Roofing Specification section.
- F. Immediately following installation, and prior to roofing application, the metal will be primed with a quick drying asphalt primer at a rate of one gallon per 100 square feet.

3.02 INSTALLATION OF ROOF FLASHING:

- A. Profile of flashing shall follow profile of roof panels.
- B. Embed Flashing in contact with roofing in Plastic Cement.

3.03 INSTALLATION OF METAL PANEL

- A. Report unacceptable conditions to the Architect. Do not begin Work until unacceptable conditions have been corrected.
- B. Erection:
 - 1. In accordance with approved Shop Drawings.
 - 2. Panels shall be plumb and true.

3. Field mitered joints shall be neat, true to line and water tight.
4. Fastening:
 - a. Typical: In accordance with approved Shop Drawings.
5. Sealants:
 - a. Seal all joints with sealant as shown on the Drawings.

3.03 CLEANING:

All work must be left clean, free of oil, grease, acid, corrosion, etc., and in proper condition to receive work Specified under Painting Section.

3.04 FLASHING AND SHEET METAL SCHEDULE:

Flashing and Sheet Metal Schedule should be used as a guide only and it is not considered as a complete list. Refer to Drawings for locations of all details for items required. In general, the schedule is divided into "Architectural" visible finished items and "Utility" non-visible items. Verify all roof flashing and penetrations with the roofing manufacturer and installer for compatibility with the roofing materials and the roofing warranties required.

A. ARCHITECTURAL SHEET METAL ITEMS: Those items visible from the interior occupied spaces, and from all exterior viewing positions.

<u>ITEM</u>	<u>LOCATION</u>	<u>MAT.</u>	<u>GA.</u>	<u>FINISH</u>	<u>REMARKS/SMACNA NO.</u>
Parapet Cap (Coping)	Refer to Drawings	G.I.	22	Shop	Plate #77, Fig. A or Fig. G with E-1 and E-4 edge styles, as indicated on drawings. Provide J9 "Drive" joints, typ. G.I. 18 where shown on drawings.
Cap Flashing	Refer to Drawings	G.I.	22	Shop	Plate #77, Fig. A or Fig. G with E-1 and E-4 edge styles, as indicated on drawings. Provide J9 "Drive" joint, typ. G.I. 18 where shown on Drawings.
Gravel Stop	Refer to Drawings	G.I.	22	Shop	Plate #39 Fig. A, Det. #1. Nail to roof (into solid member) at 4" on center.
Drip Flashing	Metal Roof, Hollow Metal Frame and Sills. Refer to Drawings.	G.I.	22	Shop	Minimum 4" under finish and minimum 4" cover.
Counter Flashing	Refer to Drawings	G.I.	22	Shop	Minimum 4" under finish and minimum 4" cover with 1/4" drip broken into bottom of flashing.
Penetration Flashing	Refer to Drawings	G.I.	22	Shop	Plate #68, Figure B. See also Plates #65, 66 and 67 for additional penetration details that may be required by the Project.

NOTE: TREMCO built-up roofing systems require Lead Flashing at penetrations to comply with their warranty requirements.

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FLASHING AND SHEET METAL
PAGE 5**

<u>ITEM</u>	<u>LOCATION</u>	<u>MAT.</u>	<u>GA.</u>	<u>FINISH</u>	<u>REMARKS/SMACNA NO.</u>
Plumbing Vent Risers	Refer to Plumbing Drawings	Lead	4#/sf	Shop	See Plumbing Details
Reglet & Counter Flashing	Masonry Parapet	G.I.	22	Shop	“Fry” Spring Lock Type MA
Expansion Flashing	Refer to Drawings	G.I.	22	Shop	Plate #91
Reglet & Counter Flashing	Plaster Parapets	G.I.	22	Shop	“Fry” Spring Lock Type ST
Scuppers	Refer to Drawings	G.I.	22	Shop	Plate #26 and #30 as required.
Rain Gutters	Refer to Drawings	G.I.	22	Shop	See Details.
Down Spouts	Refer to Drawings	G.I.	22	Shop	See Details.
Conductor Heads	Refer to Drawings	G.I.	22	Shop	See Details.
Counter Top	Refer to Drawings	S.S.	16	#4	See Details.
Metal Panels Drawings	Refer to	G.I.	20	Shop	See Details.
Counter Top	Refer to Drawings	G.I.	16	Shop	See Details.
Brows	Refer to Drawings	G.I.	16	Shop	See Details.
Fins	Refer to Drawings	G.I.	20	Shop	See Details.
Exhaust Vent Cover	Refer to Drawings	S.S.	20	#4	See Details.

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FLASHING AND SHEET METAL
PAGE 6**

<u>ITEM</u>	<u>LOCATION</u>	<u>MAT.</u>	<u>GA.</u>	<u>FINISH</u>	<u>REMARKS/SMACNA NO.</u>
S.S. Cap	Refer to Drawings	S.S.	20	#4	See Details.
Medallion (SS)	Refer to Drawings	S.S.	14	Mirror Polish	See Details.
Lintel (SS)	Refer to Drawings	S.S.	14	Mirror Polish	See Details.
Dutch Door Shelf	Refer to Drawings	S.S.	16	#4	See Details.
Silver Drop	Refer to Drawings	S.S.	16	#4	See Details.
Column Cover	Refer to Drawings	S.S.	20	#4	See Details.
Floor Trim	Refer to Drawings	G.I.	18	Shop	See Details.
Mechanical Platforms	Refer to Mechanical Drawings.	G.I.	22	Shop	See Mechanical Details

Fabrication of all the previous items shall provide a fully finished appearance on all visible surfaces. Fastenings shall be soldered joints, welded joints ground smooth, or solid flat head riveted joints only. Use of sheet metal screws, pop rivets, or bolts shall be minimized, and indicated on the Shop Drawings by the fabricator. All joints between sections shall be uniformly gapped 1/16", and splice backing shall be centered on the joint. Fabrication of the above items shall be in accordance with SMACNA Standards, Roofing manufacturer's warranty requirements where applicable, and shop practices.

B. **UTILITY SHEET METAL ITEMS:** Those items not visible from the interior occupied spaces, nor from exterior viewing positions.

<u>ITEM</u>	<u>LOCATION</u>	<u>MAT.</u>	<u>GA.</u>	<u>FINISH</u>	<u>REMARKS/SMACNA NO.</u>
Continuos Clip	Parapet Coping	G.I.	22	Shop	Compatible with Plate #77.
Counter Flashing	Refer to Drawings	G.I.	22	Shop	Minimum 4" under finish and min. 4" cover with 1/4" drip broken into bottom of flashing.

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FLASHING AND SHEET METAL
PAGE 7**

<u>ITEM</u>	<u>LOCATION</u>	<u>MAT.</u>	<u>GA.</u>	<u>FINISH</u>	<u>REMARKS/SMACNA NO.</u>
Penetration Flashing	Refer to Drawings	G.I.	22	Shop	Plate #68, Figure B. See also plates #65 -#67 for other flashing requirements that can occur on this project.

NOTE: TREMCO built-up roofing systems require Lead flashing at penetrations to comply with their warranty requirements.

Plumbing Vent Risers	Refer to Plumbing Drawings.	Lead	4#/sf	Shop	See Plumbing Details
Reglet & Counter Flashing	Masonry Parapet	G.I.	22	Shop	“Fry” Spring Lock Type MA
Sleeves in concrete at Pipes	Refer to Drawings	G.I.	22	Shop	See Details.
Expansion Flashing	Refer to Drawings	G.I.	22	Shop	Plate #91
Reglet & Counter Flashing	Plaster Parapet	G.I.	22	Shop	“Fry” Spring Lock Type ST
Scuppers	Refer to Drawings	G.I.	22	Shop	Plate #26 and #30 as required.
Roof Splash Pans	Refer to Drawings	G.I.	22	Shop	Plate #36, 2 corrugation section.
Reglet & Counter Flashing	Concrete Parapets	G.I.	22	Shop	“Fry” Spring Lock Type CO
Mechanical Platforms	Refer to Mechanical Drawings.	G.I.	22	Shop	See Mechanical Details

Fabrication of the above items shall be in accordance with SMACNA Standards, Roofing manufacturer’s warranty requirements where applicable, and shop practices.

END OF SECTION

ROOF HATCHES

PART 1 - GENERAL

1.01 SCOPE:

Provide materials, labor, equipment and services necessary to furnish and install Roof Hatches, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
03-300	CAST-IN-PLACE CONCRETE
06-100	ROUGH CARPENTRY
07-410	METAL ROOF PANELS
07-510	BUILT-UP ROOFING
07-600	FLASHING AND SHEET METAL
07-900	JOINT SEALERS

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS.

1.04 SUBMITTALS:

- A. Product Data: In accordance with Section 01-300, SUBMITTALS.
- B. Shop Drawings: In accordance with Section 01-300, SUBMITTALS.
- C. Operations Data: In accordance with Section 01-700, PROJECT CLOSEOUT.

1.05 WARRANTY:

- A. In accordance with 01-740, WARRANTIES.
- B. Warranty Period: 5 years.

PART 2 - PRODUCTS

2.01 DESIGN:

Type S-20, 30 inch x 36 inch, as manufactured by the BILCO COMPANY, or approved equivalent.

2.02 MATERIALS:

- A. Cover:
 - 1. Material:.....14 gauge galvanized steel.
 - 2. Insulation:.....1 inch fiberglass.
 - 3. Liner.....22 gauge galvanized steel.
 - 4. Flange.....3 inch beaded.

- B. Curb:
 - 1. Material:.....14 gauge galvanized steel.
 - 2. Insulation:.....1 inch thick fiberboard.
 - a. Provide continuous 1 inch thick by 3 inch fire retardant treated wood nailer for termination of roofing materials at top of curb. Fasten to top of curb from inside of curb with #10 self tapping screws at 12 inches o.c. maximum. Wire brush off any burrs from screw head on inside of curb after attaching nailers.
 - 3. Height:.....12 inches.
 - 4. Flange:.....3-1/2 inches.
 - 5. Cap Flashing: 14 gauge galvanized steel with full welded, mitered corner of watertight construction.

2.03 HARDWARE:

- A. Hardware Materials:
 - 1. Material:.....Cadmium Plated Steel.
 - 2. Hinges:.....Heavy Pintle.
 - 3. Operators:.....Compression springs enclosed in telescopic tubes.
 - 4. Latch:.....Positive Snap with turn handles and padlock hasps inside and outside.
 - 5. Cover Seal:.....Neoprene, all sides.
 - 6. Hold-open Arms:.....Automatic with handle for one hand release.

2.04 FINISH:

Cover, curb and hardware shall be cleaned and chemically treated for maximum adhesion in preparation for manufacturer’s standard primer paint.

2.05 SAFETY POST:

Provide and install BILCO Ladder Up Safety Post Model #LU-1; mount to ladder rungs per manufacturer instructions.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Prior to installation of Roof Hatches, inspect the installed Work executed under other Sections which affect the installation of Roof Hatches.

- B. Report unacceptable conditions to the Architect. Do not begin Work until unacceptable conditions have been corrected.

- C. Installation of Roof Hatches shall constitute acceptance of existing conditions.

3.02 COORDINATION:

Coordinate Roof Hatches with related items specified under other Sections to ensure proper and adequate interface of Work. All installation Work shall be under the direction of the Roofing Subcontractor.

3.03 INSTALLATION:

- A. In accordance with regulatory agencies.
- B. In accordance with manufacturer's instructions and approved shop drawings.
- C. As required for water tight assembly.

3.04 CLEANING:

In accordance with Section 01-700, PROJECT CLOSEOUT.

END OF SECTION

CAULKING

PART 1 - GENERAL

1.01 SCOPE:

- A. Provide all material, labor, equipment and services necessary to complete all caulking, accessories and other related items necessary to complete the Project as indicated by the Construction Documents unless specifically excluded.
 - 1. Provide a positive exterior barrier against penetration of air and moisture at joints where caulking are essential to continued integrity of barrier, without causing staining or deterioration of adjacent joint substrates.
 - 2. Provide caulking for interior applications that have been produced and installed to establish and to maintain watertight and airtight continuous seals that aesthetically join dissimilar materials without causing staining or deterioration of joint substrates.

1.02 STANDARDS:

- A. In accordance with 01-080 CODES AND STANDARDS.

1.03 SUBMITTALS:

- A. Product Data and Colors: In accordance with Section 01-300 SUBMITTALS.

1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extend to that indicated for the Project that have resulted in construction with a record of successful in-service performance.

1.05 JOB CONDITIONS:

- A. Environmental Requirements:
 - 1. Apply materials within manufacturer's recommended surface and ambient temperature ranges.
 - 2. Apply materials when working joints are most likely to be normal size.

1.06 WARRANTY:

- A. In accordance with 01-740, WARRANTIES.
- B. Warranty period: 2 years. Weather tight condition.

PART 2 - PRODUCTS

2.01 CAULKING

- A. General Requirements:
1. Non-staining to adjacent exposed surfaces.
 2. Primerless.
 3. Non-sagging type.
 4. Neutral color or color of adjacent material.
- B. Types: (In accordance with ASTM C920)
1. Silicone:
 - a. Type A: One part compatible with masonry substrates, DOW CORNING #790, or approved equivalent.
 - b. Type B: One part for non-porous substrates, DOW CORNING #795, or approved equivalent.
 2. Urethane Sealants:
 - a. Type A: One part, gun grade general purpose sealant, VULKEN #116, or approved equivalent.
 - b. Type B: Two part, gun grade general purpose sealant, VULKEN #227, or approved equivalent.
 - c. Type C: One part, self-leveling sealant for horizontal joints in floor and sidewalk joints, VULKEN #45, or approved equivalent.
 - d. Type D: Two part, self leveling sealant for use in horizontal joints in floor and sidewalk joints requiring a “walkable” surface within 24 hours of application, VULKEN #245 or approved equivalent.
 3. Polysulfide:
 - a. Type A: One part, gun grade, BOSTIK Chem Calk #100, or approved equivalent.
 - b. Type B: Two part, gun grade, BOSTIK Chem Calk #200, or approved equivalent.
 - c. Type C: Two part, self-leveling, BOSTIK Chem Calk #250, or approved equivalent.
 4. Butyl: (Glazing Seals)
 - a. Type A: One part, gun grade, low movement joint sealant, PTI #707, HAPCO #601, or approved equivalent.
 5. Acoustical Sealant:
 - a. Type A: For concealed joints to control dust, air and sound transmission, PRESSTITE #579.64, or approved equivalent.
 6. Fire Stop Joint Sealers:
 - a. To be used for penetrations in walls, floors or ceilings requiring protected openings shall be fire-stopped. Fire-stopping shall be an approved material, securely installed and capable of maintaining its integrity when subjected to the time-temperature curve of SFM standard 12-43-1 and 12-43-3. Manufacturer’s installation instructions shall be made available to the inspection authority and kept at the job site.

2.02 JOINT PACKING:

- A. General Requirements:
1. Compatible with joint sealers.
 2. Resilient, Non-oily and non-staining.
 3. 1.3 to 1.5 times the width of the joint.

- B. Acceptable Materials:
1. Polyethylene foam rod.
 2. Expanded polyurethane.
 3. Neoprene.
 4. Etahfoam or Denverfoam.
 5. Closed Cell PVC.
 6. As approved by Architect.

PART 3 - EXECUTION:

3.01 INSPECTION:

- A. Prior to installation of joint sealers, inspect the installed Work executed under other Sections which affect the installation of joint sealers.
- B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been corrected.
- C. Installation of joint sealers shall constitute acceptance of existing conditions.

3.02 PREPARATION:

- A. Clean adjoining surfaces in accordance with manufacturer's recommendations.
- B. Surfaces shall be dry, fully cured and free of laitance, loose aggregate, form release agents, curing compounds, water repellents, paint and other surface treatments.
- C. Sheet metal shall be wiped down with sheet metal cleaner to etch zinc coating and remove oil and foreign matter from the surface.

3.03 INSTALLATION:

- A. Primer:
1. Apply to masonry, concrete, wood and other surfaces as recommended by joint sealer manufacturer.
- B. Joint Packing:
1. Install in joints deep enough to receive packing. Install bond-breaking tape at back of joints not deep enough to receive packing.
 2. Install as required to form proper joint design.
- C. Joint Design: Unless otherwise required by joint sealers manufacturer's printed recommendations, use packing material to control sealant depth as follows:
1. Width: Not less than 1/4 inch nor more than 1/2 inch.
 2. Minimum Depth: Not less than 1/8 inch.
 3. Maximum Movement: Joint width not less than 4 times maximum movement.
 4. Width to Depth Ratio: 1/1 minimum.

- D. Caulking:
 - 1. In accordance with manufacturer's recommendations.
 - 2. Apply caulking immediately after joints are cleaned and packed.
 - 3. Force caulking into joint by tooling to insure full contact with side-walls and packing.

- E. Joint Finish:
 - 1. Unless otherwise indicated, horizontal joints shall be flush.
 - 2. Finished bead shall be smooth, even and free of wrinkling, air pockets and foreign matter with a slightly concave shape.

3.04 CLEANING:

- A. In accordance with 01-700 PROJECT CLOSEOUT.

- B. Remove surplus joint sealers immediately.

END OF SECTION

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SCOPE:

Furnish all material, labor, equipment services necessary to furnish Metal doors and Frames, Window Frames, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

08-700	FINISH HARDWARE
09-250	GYPSUM BOARD
09-900	PAINTING

1.03 WORK FINISHED BUT NOT INSTALLED:

06-100	ROUGH CARPENTRY (installation of metal frames & doors)
07-900	JOINT SEALERS

1.04 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

AWS	American Welding Society
HMMA	Hollow Metal Manufacturers Association (Division of NAAMM)
SDI	Steel Door Institute
USSG	U.S. Standard Gages

1.05 SUBMITTALS:

- A. Submit shop drawings in accordance with Section 01-300 SUBMITTALS covering each type of door and frame, each frame condition, and complete anchorage details, hardware locations on doors, supplemented by suitable schedules covering doors and frames. Show glass and lover opening sizes and locations in door where they are required.
- B. Contractor shall check all drawings and verify all dimensions (including wall thicknesses) in the field prior to fabrication.

1.06 STORAGE OF MATERIALS:

- A. Store doors and frames at site, in an upright position protected from elements, on wood blocking and in a manner to prevent damage to, or marring of finish.
- B. Store doors under cover in a secured area. Cut wrapping without damaging the door and frame finish for ventilation to prevent moisture build up.

PART 2 - PRODUCT

2.01 MANUFACTURERS

- A. Products specified are from companies listed below. These products listed herein establish the size, pattern, color range and function selected by the Architect for this Project. Manufactures listed as acceptable must still comply with the requirements of the products listed in order to be approved as an equivalent during the Submittal Process. If not approved during the Submittal Process, the Contractor shall submit product specified.
1. Acceptable door and frame manufacturers:
 - a. CECO DOOR DIVISION
 - b. REPUBLIC BUILDERS PRODUCTS
 - c. THE STEELCRAFT MANUFACTURING COMPANY
- B. Products from other manufacturers not listed must submit in accordance with specification Section 01-640 - SUBSTITUTIONS.

2.02 METAL DOORS

- A. Construction: 1-3/4 inch, in accordance with ANSI / SDI-100 "Recommended Specifications Standard Steel Doors and Frames", Grade III, Model 2, full flush, seamless design, unless otherwise indicated in the Contract Documents.
- B. Material:
1. Faces: Cold-Rolled Steel Sheets, commercial quality carbon steel, complying with ASTM A 1008 and ASTM A 568, 16 gage.
 - a. Exterior doors to be galvanized complying with ASTM A 653 (G60) (Wipe Coat" galvanized is not permitted).
 2. Core: Honeycombed core in accordance with ANSI / SDI-100 approved honeycombed core designs, and performance tested for up to 5250 lbs/sq.ft. in accordance with ANSI / SDI-A 151.1.
 - a. Provide mineral fiberboard cores when temperature rise requirements of labeled openings do not permit the use of the honeycombed core.
 3. Stiffeners: 14 gage cold rolled steel channels, continuous at bottom and top of door, spotwelded within the door, spotwelded within the door construction.
 4. Louvers: In locations as indicated on the drawings, 18 gage formed steel, inverted "y" blade construction with 30% free area, in accordance with SDI-111-C "Recommended Louver Details for Standard Steel Doors" unless noted otherwise.
- C. Fabrication in accordance with ANSI / SDI-100 "Recommended Specifications Standard Steel Doors and Frames", and the following:
1. Size and Type: Refer to drawings.
 2. Bevel lock edge 1/8" in 2" typically.
 3. Core: Sand the honeycomb core prior to contact adhesive application.
Apply adhesive to both sides as well as to both face sheets prior to assembly.
 4. Hinge, Lock and Door Edges:
 - a. Seamless vertical seams, continuously welded and ground smooth with no tool marks or surface imperfections or filled with manufacture's recommended epoxy seam sealer and filler, sanded smooth with no tool marks or surface imperfections.

5. Galvanized metal cap channels at top and bottom of all exterior doors for weather protection. Fill all gaps with epoxy sealer and filler, sand smooth with no tool marks or surface imperfections.
6. Adequately reinforce for all hardware.
 - a. At mortised template hardware: Mortise and reinforce with 7 gage steel. Drill and tap at factory.
 - b. At locks and all panic: Reinforce with 16 gage steel box reinforcement with centering tab and latch support appropriate to the type of hardware.
 - c. At closer: Reinforce with 12 gage steel box or u-shaped reinforcement welded to the top channel.
 - d. All surface mounted hardware settling to be drilled and tapped in field.
7. Glass and louver frames, molding and trim to be drilled and tapped in field. Use the same trim on all rated and non-rated openings.

2.03 TRANSOM PANELS:

- A. Transom panels shall comply with all requirements for Metal Doors.
- B. Attachment:
 1. Attach securely to frame with concealed anchorage and machine screws.
 2. Attachment including screws shall be fully concealed when door is closed.
- C. Astragal: Flat, 1-1/2 inch, 14 gage, spot welded to panel, ground smooth with no tool marks or surface imperfections.

2.04 METAL FRAMES:

- A. Materials:
 1. Metal to be cold-rolled steel, in accordance with ASTM A 1008 and ASTM A 568.
 - a. Galvanize exterior frames in accordance with ASTM A653 (G60) (“Wipe Coat” galvanized is not permitted).
 2. Metal thickness:
 - a. Frame in interior walls: 16 gage
 - b. Frame in exterior walls: 16 gage
- B. Fabrication in accordance with ANSI / SDI-100, and the following:
 1. Size, shape, thickness and profile - Refer to Drawings and Schedules.
 2. Frame sections: rolled and brake formed with **all joints tightly fitted, continuously welded on the inside face, and ground smooth with no tool marks or surface imperfections for water tightness.**
 3. Stops: Integral with frame.
 4. Corners: Saw-mitered and full (continuously) welded on the inside face of frame, and ground smooth with no tool marks or surface imperfections.
 5. Dimple metal frames at attachment points, body putty smooth and sand flush with no voids or ridges showing.
 6. Rubber door silencers:
 - a. Single swing door frames: Provide and install three (3) at strike jamb.
 - b. Double swing door frames: Provide and install four (4) at head.

7. Reinforcing for hardware: Reinforce at factory with 7 gage steel sort welded to frame to readily accept both standard weight and heavy weight hinges. Apply manufacturer's standard gage plaster guards over reinforcement in frames for concrete and masonry walls to prevent plaster from obstructing the hardware functions.
 - a. At mortised template hardware: Mortise, drill and tap at factory.
 - b. At surface applied hardware: Drill and tap in field.
8. Metal frame spreader: Provide at bottom of all open frames. Metal frame spreaders shall not be used to set frames.
9. Sound doors an exterior doors shall have anchors allowing for filled solid (grout or mortar) frame construction without obstructions.

C. Glazing Stops:

1. Material: 18 gage cold rolled steel.
2. Glazing Stops shall be drilled and punched to accept counter sunk screws at 12 inches on center maximum.

D. Anchorage:

1. Material: Galvanized iron. Gage shall be the same gage as frame.
2. Types:
 - a. For masonry wall: Strap and Stirrup Type.
 - 1) At Contractor's option, the wire loop type may be used at all non-rated door frames.
 - b. For concrete walls: Existing opening steel anchors 14 gage G.I. spacer with 3/8" diameter bolts expansion shield (minimum 2" bolt embedment in concrete).
 - c. For wood stud walls: Woods stud anchors.
 - d. For metal Stud Walls: 14 gage G.I. Spacer. Refer to drawings for details.
 - e. At jamb base: Provide adjustable steel base anchors.
 - f. At sill on concrete floor: 14 gage galvanized iron spacer. Refer to Drawings for details.
3. Spacing: Maximum eight inches from corners and maximum 24-inches on center.
4. Bolts, washers, shields, spacers and other similar fastening devices: Furnished and installed as required by frame installer.

2.05 FIRE RATED OPENINGS:

- A. Doors and transom panels shall comply with requirements of Article on METAL DOORS and Article on TRANSOM PANELS.
- B. Frames shall comply with requirements of Article on METAL FRAMES.
- C. Conform to the requirements, for assemblies and fire tested in accordance with SFM Standard 12-43-07 [C.B.C. Sec. 3503.1.1].
 1. All 20 minutes rated assemblies shall be provided with FLS approved gasketing material so installed to provide a seal where the door meets the stop on both sides and across the top.
 2. All rated doors are to be positive latching and self-closing.
- D. Doors and Frames shall carry Underwriters Laboratory or Warnoch Hersey Labels for fire ratings required on Opening Schedule.

2.06 FINISHES

- A. Factory Finish:
 - 1. After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces smooth, level and free of all irregularities.
 - 2. Clean and chemically treat (phosphatize) the metal for maximum paint adhesion in preparation for primer paint.
 - 3. Apply one coat of Rust-Inhibitive shop coated prime paint, 0.7 mils thick, as standard with the manufacturer in accordance with ANSI A 224.1
 - a. Coordinate with Section 09-900 PAINTING for providing the appropriate field applied prime paint over the manufacturer's shop prime coat that is compatible with any water based latex finish coats to prevent pin hole rusting.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Erect all metal doors, frames and finish hardware, set to established lines, plumb, true, and fully operable, and in accordance with SDI 105 "Recommended Erection Instructions for Steel Frames". Permissible installation tolerances $\pm 1/16"$.
- B. Space between frames and masonry and concrete wall construction: Cleaned out to depth of $3/4$ inch and filled with sealant. Application shall be in strict compliance with manufacturer's instructions.
- C. Fire-Rated Door Frames shall be installed strictly per Manufacturer's printed instructions. Manufacturer's printed instructions shall be made available to the inspecting authorities.
- D. Body putty smooth and sand flush with no voids or ridges showing at attachment points.

3.02 FIELD QUALITY CONTROL

- A. Inspection:
 - 1. Schedule inspections and notify the Architect, Owner's Inspector and any regulatory agencies of the time at least 48 hours prior to the inspection.
 - 2. Prior to installation all frames must be checked and corrected for size, swing, squareness, alignment, twist and plumbness.
 - 3. Proper door clearances must be maintained as follows:
 - a. Jamb Clearances.....1/8 inch, even along entire jamb lengths.
 - b. Head Clearances.....1/8 inch, even along entire head length.
 - c. Threshold Clearances.....Consistent undercut.
 - 1) Doors in fire-rated openings shall not be undercut more than is allowed by SFM Standard 12-43-4.

3.03 CLEANING

- A. Door and frames shall be clean and free of mortar, sealants and all foreign materials.

END OF SECTION

WOOD DOORS

PART 1 - GENERAL

1.01 SCOPE:

Furnish all material, labor, equipment and services necessary to furnish Wood Doors, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
08-100	METAL FRAMES
08-700	FINISH HARDWARE
09-900	PAINTING

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

NWWDA	National Wood Window and Door Association.
NWWDA	I.S. 1 "Industry Standard for Wood Flush Doors".
NFPA	National Fire Protection Association "Fire Doors and Windows" NFPA No. 80
UL	Underwriter's Laboratories "Fire Tests of Door Assemblies" (UL 10 (b) - 1970).
WIC	Woodwork Institute of California, Section 20.

1.04 QUALITY ASSURANCE:

Testing:

- A. Testing Agency Qualification: Testing agency shall be approved and recognized by enforcing agency and provide inspection of materials and workmanship during fabrication and assembly.

1.05 SUBMITTALS:

- A. In accordance with Section 01-300 PRODUCT SUBMITTALS.
 - 1. Manufacturer's literature describing products minimum six copies.
 - 2. Shop Drawings: Show door type, details and location with reference to Architect's door mark and hardware group.
 - 3. Samples
 - a. Each color, finish and pattern for wood veneer faced doors.

1.06 PRODUCT HANDLING:

- A. Provide facilities to appropriately handle and store products to prevent damage.
- B. Packaged products shall be delivered and stored in original containers with seals unbroken and labels intact.

- C. Products shall be kept dry and protected from weather. Stack off ground or potentially wet surface on level platforms.
- D. Provide and maintain identification of type, size and location of each door to permit correct installation.

1.07 WARRANTY:

In accordance with Section 01-740 WARRANTIES. Doors shall be guaranteed for life of installation against warp or twist in excess of 1/4" in any face including full diagonal. Replacement shall include finishing of new door, hardware damaged by malfunction of original door, and hanging in satisfactory operating condition.

PART 2 - PRODUCTS

2.01 WOOD DOORS:

- A. Solid Core, wood veneer faced doors, Type APC-2 as manufactured by Haley Architectural Doors or approved equal:
 - 1. Standard: Manufactured in accordance with Commercial Standard as amended and recognized by the National Wood Window and Door Association.
 - 2. Core:
 - a. Non-rated: 5-ply particle board core bonded under pressure to stiles and rails.
 - b. Fire Resistive Doors: Mineral composition core meeting requirements of specified standards.
 - 3. Fabrication: All doors marked for opening number shown on plan and with protective wrapping.
 - 4. Face Veneers: White Birch veneer; plain slice cut book match.
 - 5. Solid Wood Edges: Same species of the face and matched for color with the face veneer.
 - 6. Factory Finish: To be selected from mfrs. std. stain finishes.

2.02 HARDWARE:

- A. Finish Hardware shall be furnished under Specification Section 08-700 FINISH HARDWARE and given to the Contractor for field fitting and installation.
- B. Doors shall be pre-fit in field and provided with cut outs for hardware according to templates and NWWDA.

PART 3 - EXECUTION

3.01 INSPECTION:

Examine Opening and Hardware Schedules to verify proper coordination.

3.02 INSTALLATION:

- A. Install all plastic laminate faced wood doors in strict accordance with all pertinent codes and regulations, the original design, and the referenced standards, hanging square, plumb, and straight and firmly anchored into the position for long life under hard use.
 - 1. Comply with NFPA 80 for fitting clearances for fire-rated doors.
 - 2. For non-rated doors, provide 1/8 inch at jambs and heads; 1/16 inch per leaf at meeting stiles for pairs of doors; 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch clearance from bottom of door to top of threshold.

- B. Install all finish hardware in strict accordance with the manufacturer's recommendations, eliminating all hinge-bound conditions and making all items smoothly operating and firmly anchored into position.

3.03 DEFECTIVE WORK:

Replace, rework or otherwise make good as required doors, finish, frames or hardware found broken, damaged, disfigured or defaced. Incomplete, misaligned, or incorrectly located products will not be accepted.

END OF SECTION

EQUIPMENT ACCESS DOORS

PART 1 – GENERAL

1.01 **SCOPE:**

Provide all materials, labor, equipment and services necessary to furnish and install Equipment Access Doors, accessories and other related items necessary to complete Project as indicated by the Contract Documents unless specifically excluded.

1.02 **RELATED WORK SPECIFIED ELSEWHERE:**

00-700	GENERAL CONDITIONS
08-100	METAL DOORS AND FRAMES
08-700	FINISH HARDWARE
DIV. 15	GENERAL MECHANICAL

1.03 **STANDARDS:**

In accordance with 01-080 Codes and Standards and the following:

CSFM	California State Fire Marshal
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1.04 **SUBMITTALS:**

- A. Product Data: In accordance with Section 01-300, Submittals.
- B. Shop Drawings: In accordance with Section 01-300, Submittals.

1.05 **WARRANTY:**

- A. In accordance with Section 01-740, Warranties.

PART 2 – PRODUCTS

2.01 **ACCESS DOORS:**

- A. Design: Equal to Style DW, AT, K or M Access Door as manufactured by Milcor Incorporated, Lima, Ohio. Design shall match material condition present in each specific location. In Shower, Toilet or Locker Rooms, all exposed portions shall be brushed stainless steel.
- B. Size: 20"x30"; Architectural plans, ceiling plans, interior elevations, details and mechanical drawings.
- C. Material: Steel Frame and Door.
- D. Operation: Manual
- E. Lock: Self latching with key operated cylinder lock.
- F. Finish: Shop Primed, or as noted in A. above.
- G. Fire Rating: To match wall or ceiling assembly in which doors are located in accordance with Underwriters Laboratories ratings.

PART 3 – EXECUTION

3.01 COORDINATION:

Coordinate Access Doors with related items specified under other Sections to ensure proper and adequate interface of Work. Particular attention is called to all Mechanical Specifications and Drawings and the full cooperation required with that subcontractor's needs and work.

3.02 INSTALLATION:

- A. In accordance with regulatory agencies.
- B. In accordance with approved shop drawings and manufacturer's instructions.

END OF SECTION

ROLLING METAL COUNTER DOORS

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Rolling Metal Doors, accessories and other related items necessary to complete the Project as indicated by the Construction Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

05-100	STRUCTURAL METAL AND METAL FABRICATION
06-100	ROUGH CARPENTRY
08-100	METAL DOORS AND FRAMES
08-700	FINISH HARDWARE (Cylinders)
DIV.16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 Codes and Standards.

1.04 SUBMITTALS:

- A. Product Data: In accordance with Section 01-300 Submittals.
- B. Shop Drawings: In accordance with Section 01-300 Submittals.

1.05 WARRANTY: 2 years

In accordance with Section 01-740, Warranties.

PART 2 - PRODUCTS

2.01 TUBE MOTOR OPERATED DOORS (NON-FIRE-RATED):

- A. Tube Motor operated doors shall be of sizes and types shown on the drawings and herein scheduled equal to COOKSON "ESC10" style stainless steel rolling counter doors. (Countertop a field fabricated item.)
- B. Standard counter doors non-fire rated packaged self-contained unit.
 - 1. Curtain: 22 gage, #10 slats with bottom bar foot piece and Feather edge safety edge system.
 - 2. Barrel: Tubular motor integral with shaft assembly; steel tube counter balanced with oil tempered torsion springs set in grease sealed ball bearings.
 - 3. Hood: #4 Stainless Steel with neoprene air baffle.
 - 4. Operation: Model 11 motor with 3 button station controls, U.L listed, 115V.
 - 5. Guides: Stainless Steel angles with weatherstripping for sound sealing.
 - 6. Lock: Cylinder locking device. Cylinder supplied under Section 08-700 FINISH HARDWARE.
 - 7. Finish: Curtain, footpiece, guides and hood shall be given a uniform #4 stainless steel finish. All other parts to be given a shop coat of rust inhibiting paint.
 - 8. Verify wall thickness with finishes for width of integral frame before fabrication.

9. Sound Seals: Provide vinyl or neoprene seals for doors. At door heads use 1/8" thick continuous sheet secured to inside of coil hood. At door jambs use 1/8" thick continuous strip secured to utility side of jamb guides. Provide vinyl or neoprene continuous sill strip as sound and cushion bumpers.

2.02 MOTOR OPERATED INSULATED DOOR:

- A. Motor operated Insulated doors shall be THERMISER self contained unit of sizes as shown on the drawing and herein specified, equal to COOKSON "ESD 20" style galvanized steel rolling doors.
- B. Doors shall be pre-finished with all exposed parts finish with SPECTRASHIELD powder coating selected from manufacturer standard colors.
 1. Curtain material shall be formed from 22 gage, Slat No. 10 with tubular shaped bar which totally conceals all locking devices. Slat R valve 8.0 provide weatherstrip seal at the bottom of bar.
 2. Barrel: 4 inch minimum steel tube counter balanced with oil tempered torsion springs set in grease sealed ball bearings.
 3. Hood: 24 gage with neoprene air baffle.
 4. Operation: Electric motor.
 5. Guides: stainless steel angles with weather-stripping for sound sealing.
 6. Lock: Cylinder locking device: Cylinder supplied under Section 08-700 FINISH HARDWARE.
 7. Sound Seals: meet STC of 18.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. In accordance with approved shop drawings and manufacturer's instructions.
- B. Plumb, true and adjusted for easy operation.
- C. All Rolling Metal Counter Doors shall be installed by a manufacturer's authorized installer.

END OF SECTION

PART 1- GENERAL

1.1 SUMMARY

- A. Section includes the translucent window panel system as shown and specified. Work includes providing and installing:
 - 1. Flat factory prefabricated structural insulated translucent sandwich panels.
 - 2. Aluminum installation system.
 - 3. Aluminum sill flashing.
- B. Related Sections:
 - 1. Rough Carpentry: Section 06-100
 - 2. Flashing & Sheet Metal: Section 07-600
 - 3. Sealants: Section 07-900
 - 4. Glazing: Section 08-800

1.2 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of components.
- B. Submit shop drawings. Include elevations, details, dimensions and attachments to other work.
- C. Submit manufacturer's color charts showing the full range of colors available for factory finished aluminum.
 - 1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below.
 - a. Sandwich panels: 14" x 28" units
 - b. Factory finished aluminum: 5" long sections
- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- E. Submit product test reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements. Previously completed test reports will be acceptable.
 - 1. Test reports required are:
 - a. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
 - b. Color Difference (ASTM D-2244)
 - c. Impact Strength (UL 972)
 - d. Insulation U-Factor (NFRC-100)
 - e. NFRC System Certification
 - f. Condensation Resistance Factor (AAMA 1503)

- F. Submit current documentation indicating regular, independent quality control monitoring under a nationally recognized building code review and listing program.

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications
 - 1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten (10) consecutive years and which can show evidence of those materials being satisfactorily used on at least six (6) projects of similar size, scope and location. At least three (3) of the projects shall have been in successful use for ten (10) years or longer.
- B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified panel systems for at least five (5) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.
- C. Performance Requirements: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.
 - 1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 DELIVERY STORAGE AND HANDLING

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging.
- B. Store panels on the long edge, several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.5 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work which fails in materials or workmanship within two (2) years of notice of project completion. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work. (Contact local representative for extended warranty periods.)

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kalwall Corporation, tel: (800) 258-9777 – fax: (603) 627-7905 – email: info@kalwall.com
Class 'A' walls per ASTM E-180 or roof – UL 790 and ICC # PFC – 1705.

2.2 PANEL COMPONENTS:

- A. Face Sheets
 - 1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
 - 2. Appearance:
 - a. Exterior face sheets: Smooth, 0.070" thick and white in color.
 - b. Face sheets: Smooth, 0.045" thick and white in color.
 - c. Face sheets shall not vary more than +/- 10% in thickness and be uniform in color.
- B. Grid Core
 - 1. Aluminum I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I- beam shall be no less than 7/16". The I-beam grid shall be machined to tolerances of not greater than +/- .002".

2.3 PANEL CONSTRUCTION:

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets resin laminated to a grid core of mechanically interlocking (aluminum) I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat sharp edge.
 - 1. Thickness: 2 3/4 "
 - 2. Light transmission: 15%.
 - 3. Solar heat gain coefficient: .30.
 - 4. U-factor by NFRC certified laboratory: (0.29) aluminum I-beam].
 - 5. Grid pattern: Nominal 12" x 24" shoji.
- B. Panels shall deflect no more than 1.9" at 30 psf in 10'-0" span without a supporting frame by ASTM E-72.

2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

- A. Closure system: Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
- B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.

- C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.
- D. Finish: Exposed aluminum to be manufacturer's factory applied finish that meets the performance requirements of AAMA 2604.
 - 1. Color: selected from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, supporting structure and installation conditions. Do not proceed with panel erection until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.
 - 3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

3.3 INSTALLATION

- A. Install the panel system in accordance with approved drawings.
 - 1. Anchor component parts securely in place by permanent mechanical attachment system.
 - 2. Accommodate thermal and mechanical movements.
 - 3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 CLEANING

- A. Clean the panel system inside and outside, immediately after installation, according to manufacturer's written recommendations.

END OF SECTION

FINISH HARDWARE

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Finish Hardware, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

06-100	ROUGH CARPENTRY
08-100	METAL DOORS AND FRAMES
10-050	MISCELLANEOUS SPECIALTIES

1.03 WORK INSTALLED BUT FURNISHED BY OTHERS:

06-200	FINISH CARPENTRY (Installation of Finish Hardware)
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1.04 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

ASAHC	American Society of Architectural Hardware Consultants
ASTM	American Society for Testing and Materials

1.05 SUBMITTALS:

- A. Submit 6 copies of Finish Hardware Schedule. Include all Hardware to be used, giving opening locations and numbers, and catalog numbers. Submit catalog cut of each item with Finish Hardware Schedule.
- B. Certificate: Hardware suppliers' certification of hardware inspection required in Section 3.04, B, Inspection.

1.06 PRODUCT DELIVERY:

- A. Plainly mark all packages, noting use and opening numbers.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. SPECIALIZED BUILDERS HARDWARE, HAGER, NORTON, PEMKO, SCHLAGE, AND SARGENT.

2.02 KEYING:

- A. Master Key and Grandmaster Key all cylinder locks to Owner's existing Grand Master System with no substitutions. All cylinders to be Schlage; no substitutions.
- B. Keying as directed by Architect or Owner (District Maintenance).
- C. Locks and cylinders to be construction Master Keyed.
- D. Provide 3 keys per lock and 12 master keys each; stamp "do not duplicate".
- E. At the time of final acceptance of the work; the owner will remove construction key and key doors to new system.

2.03 LOCKS AND LATCHING DEVICES:

- A. All doors shall be operable from within, without the use of a key by merely rotating the latching handle with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force to activate operable parts shall not exceed 5.0 pounds.
- B. All doors in areas used by students shall be self-releasing type, operable from within without the use of a key or special knowledge or effort.
- C. Opening hardware shall be centered between 34" - 43" above Finish Floor

2.04 DOOR CLOSERS:

- A. Size of closers in accordance with manufacturer's recommendations for door size scheduled and location where used. Pressure setting shall conform to handicapped requirements as follows:
5.0 pounds maximum force to open at all doors.
Note: Door Closer Adjustment – Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

2.05 ANCHORAGE:

- A. Furnish all screws, anchors, rough blocking or other devices necessary for the proper installation of Finish Hardware conforming with the Hardware as to material and finish.

2.06 STRIKE COVER:

- A. Provide strike cover plate at all exterior doors.

2.07 PADLOCKS:

- A. Padlocks: Master padlocks.
 - 1. For hollow metal gates, service yard gates, chain link gates, roof screen gates, flagpole and roof hatches. Padlocks keyed as per District Maintenance.
 - 2. For disconnect switches on air conditioning units: Per District.

2.08 FINISH:

- A. Finish as noted on Drawings or listed in Article 3.05 Finish Hardware Schedule.

PART 3 - EXECUTION

3.01 TEMPLATES:

- A. Furnish all required hardware templates.

3.02 INSTALLATION:

- A. Coordinate the blocking required for all wall mounted finish hardware.
- B. Installation of Finish Hardware specified in Section 06-200 FINISH CARPENTRY.
- C. Installation of Exit Devices per District Standards.

3.03 ASSISTANCE IN INSTALLATION:

- A. Assist and advise installer in correcting field problems arising during installation of Finish Hardware. Be on the Project with 48 hours upon being notified by the General Contractor.
- B. Assist Installer in the proper adjustment of all door closers, and other operating devices.

3.04 INSPECTION:

- A. Upon installation, inspect all Finish Hardware to assure that it was installed correctly and is in proper working order.
- B. In the presence of the Inspector, Owner Lock Personnel and General Contractor, check all locks and verify that they have been installed in accordance with Article 3.05 Finish Hardware Schedule, and the Keying Schedule.

3.05 FINISH HARDWARE SCHEDULE:

- A. Finish Hardware Schedule should be used as a guide only. In case of omissions, furnish Hardware in accordance with that scheduled for a similar opening.
- B. ALL KEYING SHALL BE ON ESTABLISHED OWNER'S EXISTING SCHLAGE GRANDMASTER SYSTEM.
- C. All rated doors are to be positive latching and self-closing.
- D. "Label" shall mean "ASSEMBLY" as defined in CBC Section 710.5.2.
- E. All 20-minute rated assemblies shall be provided with approved gasketing material so installed to provide a seal where the door meets the stop on both sides and across the top.
- F. Lever handles shall return to within 1/2 inch off door face.
- G. All thresholds in the path of travel shall comply with CBC 11B-404.2.5.

FINISH HARDWARE SCHEDULE:

HARDWARE MANUFACTURERS: **MFR #**

HAGER.....	HGR
SCHLAGE.....	SCH
LCN.....	LCN
TRIMCO.....	TRI
PEMKO.....	PEM
SARGENT.....	SAR
VON DUPRIN.....	VON
MCKINNEY.....	MCK
GLYNN JOHNSON.....	GLY
IVES.....	IVES

MULTI-USE BUILDING:

GROUP #1: DOOR 1, 2, 3 & 4

8	HINGE	BB1168 4.5x4.5 NRP	652	HGR
1	EXIT DEVICE	AX-PA-CD99NL	626	VON
1	EXIT DEVICE	AX-PA-CD99EO	626	VON
1	MULLION	KR4954 8'6"	SP28	VON
2	GLASS BEAD KIT	99GBK-R	SP28	VON
1	RIM CYLINDER	20-057 ICX	626	SCH
2	MORTISE CYLINDER	20-061 ICX	626	SCH
1	MORTISE CYLINDER	20-061 ICX XQ11-948	626	SCH
4	CORE	20-740	626	SCH
2	CLOSER	4111EDA	689	LCN
1	PULL	VR910NL	630	IVES
1	PULL	VR910DT	630	IVES
2	STOP/HOLDER	1267	626	TRI
2	ANCHOR	1268	626	TRI
2	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	THRESHOLD	PER DETAIL		
2	DOOR BOTTOM	PER DETAIL		
1	MULLION SEAL	5110BL		PEM
1	HEAD SEAL	2891AS		PEM
2	JAMB SEAL	290AS		PEM

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FINISH HARDWARE
PAGE 5**

GROUP #2: DOOR 5, 6 & 8

				MFR
6	HINGE	BB1168 4.5 X 4.5 NRP	652	HGR
1	LOCKSET	ND80T RHO	626	SCH
1	PRIMUS CORE	20-740	626	SCH
2	CLOSER	4111EDA	689	LCN
1	COORDINATOR	COR X FL	628	IVES
2	MOUNTING BRACKET	MB1/MB2 AS REQUIRED	628	IVES
2	FLOOR STOP/HOLDER	1267	626	TRI
2	ANCHOR	1268	626	TRI
2	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	THRESHOLD	PER DETAIL		
2	DOOR BOTTOM	PER DETAIL		
1	HEAD SEAL	S88D		PEM
2	JAMB SEAL	290AS		PEM

GROUP #3: DOOR 7

6	HINGE	BB1168 4.5 X 4.5 NRP	652	HGR
1	LOCKSET	ND53T RHO	626	SCH
1	PRIMUS CORE	20-740	626	SCH
2	CLOSER	4111EDA	689	LCN
1	COORDINATOR	COR X FL	628	IVES
2	MOUNTING BRACKET	MB1/MB2 AS REQUIRED	628	IVES
2	FLOOR STOP/HOLDER	1267	626	TRI
2	ANCHOR	1268	626	TRI
2	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	THRESHOLD	PER DETAIL		
2	DOOR BOTTOM	PER DETAIL		
1	HEAD SEAL	S88D		PEM
2	JAMB SEAL	290AS		PEM

GROUP #4: DOOR 9 & 10

3	HINGE	BB1168 4.5 X 4.5 NRP	652	HGR
1	EXIT DEVICE	AX-PA-CD-99NL-OP	626	VON
1	RIM CYLINDER	20-057ICX	626	SCH
1	MORTISE CYLINDER	20-061ICX	626	SCH
2	PRIMUS CORE	20-740	626	SCH
1	CLOSER	4111SCUSH	689	LCN
1	VANDAL TRIM	VR910NL	630	IVES
1	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	THRESHOLD	PER DETAIL		
1	DOOR BOTTOM	PER DETAIL		
1	HEAD SEAL	2891AS		PEM
2	JAMB SEAL	290AS		PEM

GROUP #5: DOOR 11

3	HINGE	BB1168 4.5 x 4.5 NRP	652	HGR
1	LOCKSET	ND53TD RHO	626	SCH
1	CORE	20-740	626	SCH
1	CLOSER	4111EDA	689	LCN.
1	STOP/HOLDER	1267	626	TRI
1	ANCHOR	1268	626	TRI
1	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	THRESHOLD	PER DETAIL		
1	DOOR BOTTOM	PER DETAIL		
1	HEAD SEAL	2891AS		PEM
2	JAMB SEAL	290AS		PEM

GROUP #6: DOOR 12

3	HINGE	BB1168 4.5 X 4.5 NRP	652	HGR
1	LOCKSET	ND80T RHO	626	SCH
1	PRIMUS CORE	20-740	626	SCH
1	FLOOR STOP/HOLDER	1267	626	TRI
1	ANCHOR	1268	626	TRI
1	THRESHOLD	PER DETAIL		
1	DOOR BOTTOM	PER DETAIL		
3	SILENCER	1229A	GRY	TRI

GROUP #7: DOOR 13

3	HINGE	BB1168 4.5x4.5 NRP	652	HGR
1	EXIT DEVICE	AX-PA-CD99NL-OP	626	VON
1	RIM CYLINDER	20-057 ICX	626	SCH
1	MORTISE CYLINDER	20-061 ICX XQ11-948	626	SCH
2	CORE	20-740	626	SCH
1	CLOSER	4111EDA	689	LCN
1	PULL	VR910NL	630	IVES
1	STOP/HOLDER	1267	626	TRI
1	ANCHOR	1268	626	TRI
1	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	THRESHOLD	PER DETAIL		
1	DOOR BOTTOM	PER DETAIL		
1	HEAD SEAL	2891AS		PEM
2	JAMB SEAL	290AS		PEM

GROUP #8: DOOR 17 & 24

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	PULL PLATE	1017-3	630	TRI
1	PUSH PLATE	1001-11	630	TRI
1	CLOSER	4011	689	LCN
1	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	WALL STOP	1270WV	630	TRI
3	SILENCER	1229A GRY		TRI

GROUP #9: DOOR 18, 27 & 28

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	LOCKSET	ND80TD RHO	626	SCH
1	CORE	20-740	626	SCH
1	WALL STOP	1270WV	630	TRI
3	SILENCER	1229A GRY		TRI

GROUP #10: DOOR 19

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	LOCKSET	ND53T RHO	626	SCH
1	PRIMUS CORE	20-740	626	SCH
1	CLOSER	4111EDA	689	LCN
1	WALL BUMPER	1270WV	630	TRI
1	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	SEAL	S88D		PEM

GROUP #11: DOOR 20 & 21

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	LOCKSET	ND80TD RHO	626	SCH
1	CORE	20-740	626	SCH
1	CLOSER	4111CUSH	689	LCN
1	SEAL	S88D		PEM

GROUP #12: DOOR 22 & 23

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	LOCKSET	ND80T RHO	626	SCH
1	PRIMUS CORE	20-740	626	SCH
1	CLOSER	4011REG	689	LCN
1	WALL BUMPER	1270WV	630	TRI
1	KICK PLATE	K0050 10" X 2" LDW	630	TRI
1	SEAL	S88D		PEM

GROUP #13: DOOR 25

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	LOCKSET	ND53T RHO	626	SCH
1	PRIMUS CORE	20-740	626	SCH
1	DOME STOP	1211	626	TRI
3	SILENCER	1229A	GRY	TRI

GROUP #14: DOOR 26

3	HINGE	BB1279 4.5 x 4.5	652	HGR
1	PRIVACY	ND40 RHO	626	SCH
1	WALL BUMPER	1270WV	630	TRI
3	SILENCER	1229A	GRY	TRI

END OF SECTION

GLASS AND GLAZING

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to complete all Glass and Glazing and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

05-100	STRUCTURAL METAL AND METAL FABRICATIONS
08-100	METAL DOORS AND FRAMES
10-050	MISCELLANEOUS SPECIALTIES

1.03 WORK INSTALLED BUT FURNISHED BY OTHERS:

08-100	METAL DOORS AND FRAMES (Glazing Stops)
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1.04 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

FGMA	Flat Glass Marketing Association 1990 Manual
IGCC	Insulating Glass Certification Council
AAMA	American Architectural Manufacturers Association
ANSI	American National Standards Institute

1.05 ACCEPTABLE MANUFACTURERS:

A. The following list of glazing manufacturers are acceptable for use on this project subject to conformance to the requirements of this specification:

1. GLODE AMERADA GLASS CO.
2. LIBBY-OWENS-FORD CO. (LOF)
3. PPG INDUSTRIES, INC.
4. SAINT-GOBAIN
5. AFG INDUSTRIES INC.
6. PITTSBURG CORNING CORPORATION
7. or approved equivalent.

1.06 SUBMITTALS:

A. Product Data: In accordance with Section 01-300 SUBMITTALS.

B. Contractor shall submit glass and glazing system samples for approval. Samples of each of the glass types submitted shall be 12" x 12".

PART 2 - PRODUCTS

2.01 GLASS:

- A. In accordance with ASTM C1048 and C1036, and CBC Chapter 24.
 - 1. Mirror glass shall be in accordance with ANSI Z 91.
- B. Glass subject to human impact shall conform to CBC 2406.2(1) Category Class II. Refer to opening schedule for glass types. Each pane shall be permanently marked in compliance with CBC Section 2406.3.
- C. Insulated Glass Units to be certified with the IGCC to be Level CBA Rated in accordance with ASTM E 773 and ASTM E 774.
- D. Glass Schedule:

<u>Type</u>	<u>Description</u>	<u>Visible Light (%)</u>		<u>SHGC</u>	<u>Coefficient</u>
		<u>Thickness</u>	<u>Transmittance</u>		
I	Grey Float "Graylite" Tinted PPG INDUSTRIES, INC.	1/4"	0.14		0.53
II	Grey Float Tempered "Graylite" Tinted PPG INDUSTRIES, INC.	1/4"	0.14		0.53
III	Clear Float "Clear Glass" PPG INDUSTRIES, INC.	1/4"	0.89		0.95
IV	Clear Float Tempered "Clear Glass" PPG INDUSTRIES, INC.	1/4"	0.89		0.95
V	Clear Float Wire Glass, 1" sq. pattern AFG INDUSTRIES, INC.	1/4"		-	-
VI	Safety Mirror Glass Wall "Clear Glass" (Annealed Mirror with Category II Safety Backing) PPG INDUSTRIES, INC.	1/4"			
VII	Insulated Glazing (Tempered where noted on dwgs.) (Obscured Glass type where noted) SOLARBAN 67 (2) SOLARGRAY + CLEAR PPG INDUSTRIES, INC	1"	.27		.20
VIII	Spandrel Glass Starphire Opaci-Coat 300 Ocean Mist Color PPG INDUSTRIES INC.	1/4"			
IX	One Way Mirror Glass	1/4"			

2.02 GLAZING TAPE:

Preformed Butyl-Polyisobutylene Glazing Tape: Provide manufacturer's standard solvent-free butyl-polyisobutylene formulation with a solids content of 100 percent; complying with AAMA A 804.1; in extruded tape form; non-staining and non-migrating in contact with nonporous surfaces; packaged on rolls with a release paper on one side; with continuous spacer rod as recommended by manufacturers of tape and glass for application indicated.

Safety glazing shall be identified per 2022 CBC. 2406.3.

2.03 ACCESSORIES:

- A. Lockstrip Gaskets: (If applicable)
 - 1. Provide "STANLOCK" dry glazing lockstrip gaskets where required and as indicated on the drawings.

PART 3 - EXECUTION

3.01 INSTALLATION OF GLASS:

- A. In accordance with CBC and the FGMA manual.
- B. In accordance with manufacturer's recommendations and the FGMA manual.

END OF SECTION

LATH AND PLASTER

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Lath and Plaster, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
06-100	ROUGH CARPENTRY
07-200	BUILDING INSULATION
07-600	FLASHING AND SHEET METAL
09-510	ACOUSTICAL CEILINGS
09-900	PAINTING
DIV. 15	MECHANICAL
DIV. 16	ELECTRICAL

1.03 WORK INSTALLED BUT FURNISHED BY OTHERS:

DIV. 15 MECHANICAL (Access Doors)

1.04 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

CLPCA	California Lathing and Plastering Contractors Association, Inc. "Reference Specifications"
FS	Federal Specification
MLMA	Metal Lath Manufacturer's Association "Specification for Metal Lathing and Furring"

1.05 QUALITY ASSURANCE:

- A. Work shall be performed by skilled workers experienced in this type of work.
 - 1. Maximum variation from True Flatness: 1/8 inch in 10 feet.

1.06 SUBMITTALS:

- A. Samples: In accordance with 01-300, SUBMITTALS, Submit 12 x 12 inch sample panels of each type of Plaster Finish Coat to Architect a minimum of 30 days prior to application of Finish Coat.
- B. Product Data: In accordance with 01-300, SUBMITTALS.

1.07 ENVIRONMENTAL CONDITIONS:

- A. No plastering shall be done under unsuitable conditions of weather or temperature. No plastering shall be done when prevailing temperature is 40 degrees F or less.

PART 2 - PRODUCTS

2.01 LATHING MATERIALS:

- A. Lath:
1. Expanded Metal Lath: 3.4 pounds per square yard galvanized steel in accordance with ASTM C 847.
Provide 3/8" rib lath @ plaster ceiling with joist's spacing greater than 16" o.c.
 2. Woven Wire Fabric Lath (Paperbacked Stucco Self-Furring Netting): 1 1/2 inch x 17 gage galvanized hexagon shaped mesh with 18 gage galvanized line wire over Class D paper in accordance with CBC, Table 2507.2 and equal to Type SFB Self-Furring as manufactured by K-LATH, Division of GEORGETOWN WIRE COMPANY, INC.
- B. Building Paper:
1. Kraft waterproof building paper, Grade D, in accordance with CBC 1404.2.
 2. Asphalt - saturated rag felt, Type 15 (15 pound), in accordance with CBC 1404.2.
- C. Wire:
1. Hanger Wire: 8 gage galvanized annealed steel wire.
 2. Metal Lath Tie Wire: 18 gage galvanized annealed steel wire in accordance with FS QQ-W-461 a.
 3. Suspended Grid Tie Wire: 16 gage galvanized annealed steel wire in accordance with FS QQ-W-461 a.
- D. Accessories (Verify thickness of accessories with overall plaster thickness indicated):
1. Expansion Joints: Galvanized steel equal to WESTERN No. XJ15-3, or approved equivalent.
 2. Casing Bead: 26 gage galvanized steel equal to WESTERN No. 66, or approved equivalent.
 3. Corner Beads: 26 gage galvanized steel equal to WESTERN No. 1A expanded metal wing, or approved equivalent.
 4. Drip Mold: SUPERIOR No. 10, or approved equivalent.
 5. Vents: Equal to SUPERIOR No. 115, 3-1/2 inch "Ventilation Expansion Screeds", or approved equivalent.
 6. Foundation Sill Screed: 30 gage galvanized steel equal to WESTERN No. 7, or approved equivalent, typical at base of all plaster walls unless otherwise noted.
 7. Special Trim Shapes: Aluminum as shown on the Drawings equal to FRY REGLET shapes, or approved equivalent.
 8. Separation Screed: SUPERIOR No. 17, or approved equivalent.
 9. Glass Fiber Mesh: Self-adhesive, 4"x9" regular glass fiber mesh for all "opening corner reinforcement".
- E. Fasteners
1. Staples or screws: 16 gage 1-1/4 inch long galvanized diversion point, power driven staples or pan head screws with 3/8 inch heads.
 2. Lath nails: 12 gage, 2 inch long (minimum) galvanized steel wire roofing nails having 3/8 inch diameter head and 3/4 inch diameter galvanized steel washers.
 3. Tie Nails: 10d galvanized nails.
 4. Metal Fastening Screws: 1/4" dia. self-drilling pan head steel screws.

2.02 CEMENT PLASTER MATERIALS:

- A. Cement: Type I or II Portland Cement in accordance with ASTM C150.

- B. Plastic Cement: In accordance with ASTM C150 Type I or II except in respect to the limitations on insoluble residue, air-entrainment, and additions subsequent to calcination.
- C. Miracle Lime: Type S in accordance with ASTM C206.
- D. Sand: In accordance with ASTM C 897 (or ASTM C 144 when ASTM C897 IS NOT AVAILABLE) Grading in accordance with CLPCA Section 6.6.2.
 - 1. Grading:

<u>U.S. STANDARD SIEVE</u>	<u>CUMULATIVE WEIGHT PERCENT RETAINED</u>	
	<u>MINIMUM</u>	<u>MAXIMUM</u>
NO. 4	---	0
NO. 8	0	10
NO. 16	10	40
NO. 30	30	65
NO. 50	70	90
NO.100	95	100
NO.200	97	100

- E. Finish Coat Sand: Washed, white silica sand, a.k.a. Monterey Sand.
- F. Surface applied liquid bonding agent: Resinous emulsion with the following minimum requirements:
 - 1. Minimum tensile strength.....60 psi
 - 2. Minimum compressive shear strength.....300 psi

2.03 CEMENT PLASTER MIXES:

- A. Scratch Coat Mix
 - 1. One half part Cement.
 - 2. One half part Plaster Cement.
 - 3. Four parts Sand.
- B. Brown Coat Mix
 - 1. One half part Cement
 - 2. One half part Plastic Cement
 - 3. Five parts Sand.
- C. Finish Coat Mix
 - Type 1. Exterior (Elastomeric Finish Coat):
 - a. Primer
 - b. Finish Coat
 - Type 2. Exterior (Cement Plaster Finish Coat):
 - a. One part cement.
 - b. One part Miracle Lime.
 - c. Four parts Finish Coat Sand.
 - Type 3. Interior (Cement Plaster Finish Coat):
 - a. One part cement.
 - b. One part Miracle Lime.
 - c. Four parts Finish Coat Sand.

2.04 ELASTOMERIC FINISH COAT: NOT APPLICABLE

- A. The following STO finish system shall be applied to all exterior plaster walls and soffits. Products form SYNERGY, PLEKO and DRYVIT are considered approved equivalents, subject to the specific requirements of this section.
1. Level with STO BTS-A as required.
 2. STO GRUNDEX primer as manufactured by STO INDUSTRIES, INC., or approved equivalent, is to be applied over the leveling coat (brown coat) before application of the STO color coat.
 3. Finish coat: "STOLIT K.75" extra fine finish as selected by the Architect and as manufactured and applied by STO INDUSTRIES, INC., or approved equivalent. Color or colors shall be as selected by the Architect from manufacturer's full range of colors.
- B. All miscellaneous metal drips, expansion joints, grills, screeds, etc., shall be primed and painted to match wall finish color in accordance with 09-900 Painting.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Examine all surfaces to receive Lath and Plaster and determine that they are substantial, sound, plumb and true. Report all unsatisfactory conditions to Architect. Do not start Work until all unsatisfactory conditions are corrected. Installation of Lath and Plaster shall constitute installer's acceptance of surfaces.

3.02 INSTALLATION OF PAPER BACKED LATH OVER METAL STUD FRAMING OR PLYWOOD:

- A. Install K-Lath (Grade D) Stucco Netting 1 ½" x 17 Ga. Galv. SF over two layers of Grade D paper in accordance with manufacturer's instructions and CBC Section 2507 and 2510 for a two layer application.
1. Install asphalt saturated felt, 9" to 12" wide on each side of all exterior openings, weatherboard fashion over drip flashing at all exterior openings.
- B. Fasten at 6 inches on center with #8 x 1 5/8" self-furring K-lath screws with large enough heads to fill the penetration they make in the paper.

3.03 INSTALLATION OF METAL LATH OVER METAL FRAMING:

- A. Install Expanded Metal Lath over metal framing less than 24 inches on center, and in accordance with CBC Sections 2507 and 2510.
- B. Fasten lath to metal framing with #8 x 1 5/8" self-furring K-lath screws at 6 inches on center.
- C. Where lath is attached to horizontal metal supports install in compliance with ASTM C926 & ASTM C1063; per CBC Section 2510.
- D. No joints shall be permitted at any angle or corner.

3.04 INSTALLATION OF ACCESSORIES:

- A. Install expansion joints, metal casing, corner beads, drip moulds and vents in accordance with manufacturer's instructions. Lath shall be broken at all expansion joints with ends, fully supported in accordance with CBC, secured to expansion bead flanges. Maintain the weather barrier continues behind any joints.
- B. Refer to Drawings for location.
- C. Where dissimilar metals come into surface contact provide electrolytic protection between dissimilar metals using neoprene, plastic sheet, EPDM rubber or other protective coating.

3.05 APPLICATION OF PLASTER OVER LATH:

- A. Application of Scratch Coat
 - 1. Cover Lath totally and completely with Scratch Coat Mix.
 - 2. Finish: Heavily scratched at right angles to framing members to provide strong mechanical key for Brown Coat.
 - 3. Curing: Moist cure 48 hours minimum.
- B. Application of Brown Coat
 - 1. Apply Brown Coat Mix to slightly moist, cured, Scratch Coat.
 - 2. Finish: Dry rod to a straight even plane 1/8 inch in 10 feet.
 - 3. Curing: Moist cure 48 hours minimum and dry cure 7 days minimum allowing time for plaster to shrink prior to application of finish coats.
- C. Application of Cement Plaster Finish Coat:
 - 1. Interior:
 - a. Apply 2 coats of Finish Coat Mix. First coat to create a bond with Brown Coat. Apply second coat immediately after first coat.
 - b. Finish: Float to a smooth even texture with a steel trowel to match gypsum board finishes.
 - c. Thickness: Total thickness of both coats 1/8 inch minimum.
 - d. Curing: Moist cure 48 hours minimum.
 - 2. Exterior:
 - a. Apply glass fiber mesh diagonally at all corners of openings on exterior plaster Brown Coat after curing time.
 - b. Apply 2 coats of Finish Coat Mix. First coat to create a bond with Brown Coat. Apply second coat immediately after first coat.
 - c. Finish: Float to a smooth even texture with a steel trowel to match gypsum board finishes.
 - d. Thickness: Total thickness of both coats 1/8 inch minimum.
 - e. Curing: Moist cure 48 hours minimum during hot, dry, and windy conditions.
- D. Application of Elastomeric Finish Coat:
 - 1. Exterior:
 - a. Apply glass fiber mesh diagonally at all corners of openings on exterior plaster Brown Coat after curing time.
 - b. For application techniques refer to STO Technical Bulletin #145, #710, and #810.
 - c. Level the brown coat surface as required with STO BTS-A.
 - d. Prime seal with STO GRUNDEX as required.
 - e. Finish with STO STOLIT K.75 (extra fine finish). Follow manufacturer's recommendations for application and temperature ranges.

- E. Thickness of Cement Plaster/Elastomeric Finish System or Cement Plaster Finish System:
 - 1. Vertical and Horizontal Surfaces: 7/8 inch minimum.
 - 2. Horizontal Surfaces with Expanded Metal Lath: 7/8 inch.

3.06 APPLICATION OF PLASTER OVER CONCRETE AND MASONRY: NOT APPLICABLE

- A. Application of Bond Coat:
 - 1. Apply Bond Coat Agent Mix (in accordance with 09-100 2.02, F.) solid over masonry or concrete and fill all pores completely to form bonding, water resistant finish.
 - 2. Cure: Moist cure for 48 hours.
- B. Application of Brown Coat: In accordance with paragraph 09-100 3.06, Application of Plaster Over Lath, Brown Coat.
- C. Application of Finish Coat: In accordance with paragraph 09-100 3.06, Application of Plaster Over Lath, Finish Coat.
- D. Thickness of Plaster: 1/2 inch minimum.

3.07 SURFACE FINISHES:

- A. Cement Plaster:
 - 1. Interior: "Smooth Finish" achieved with a steel trowel and a light stipple to match gypsum board finishes.
 - a. Apply a first dash coat to produce complete coverage.
 - b. Apply a second dash coat for texture depth and uniformity when first coat is dry using a plaster mix of thinner consistency.
 - c. Use proportionately more atomizing air at the gun nozzle.
 - 2. Exterior: "Light Dash" finish as indicated in the current "Plaster and Drywall Systems Manual".
 - a. Apply a first dash coat to produce complete coverage.
 - b. Apply a second dash coat for texture depth and uniformity when first coat is dry using a plaster mix of thinner consistency.
 - c. Use proportionately more atomizing air at the gun nozzle.
- B. Elastomeric Finish:
 - 1. Exterior: STO Extra fine finish.

END OF SECTION

LIGHTGAGE METAL FRAMING

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment and services necessary to furnish and install Lightgage Metal Framing, accessories and other related items such as suspended furring necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

07-900	CAULKING
08-100	METAL DOORS AND FRAMES
09-250	GYPSUM WALLBOARD
09-510	ACOUSTICAL CEILINGS
DIV.15	MECHANICAL
DIV.16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 Codes and Standards and the following:

ASTM	American Society for Testing Materials
AISI	American Iron and Steel Institute
AWS	American Welding Society

1.04 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Design is based on products of "Angeles Metal Systems" Company or approved equivalent for lightgage metal framing.
- B. Installer Qualifications: Use only trained, experienced Journeymen personnel completely familiar with specified products, systems, manufacturer's recommended installation methods and all requirements of their Work.

1.05 SUBMITTALS:

- A. Product Data and Material Lists: In accordance with Section 01-300 SUBMITTALS.
- B. Manufacturer's current installation method recommendations for non structural items. When approved by the Architect they shall be the basis for acceptance or rejection of actual installation method. Walls and ceilings shall be installed per the drawings.

1.06 JOB CONDITIONS:

- A. General
 - 1. Field Measurements: Take and be responsible for field measurements as required. Report any significant differences between field dimensions and the contract document conditions to Architect.
 - 2. All preparatory Work within spaces shall be complete except for minor additions and adjustments.

PART 2 - PRODUCTS

2.01 MATERIALS - GENERAL:

- A. All metal studs and accessories, unless otherwise specifically approved by Architect, shall be prime coated steel at interior applications, and galvanized at exterior locations and within 10 lineal feet of the perimeter of slabs.
 - 1. Metal Quality for zinc-coated (galvanized) steel sheet will comply with ASTM A 653, coating designation G 60 minimum, for grades indicated below.
- B. Studs and runners shall be standard, roll-formed in following sizes and gages and/or as detailed:
 - 1. Studs, joists and tracks are formed from steel having a minimum 33,000 psi (228 MPa) yield point (ASTM A1003 SS Grade 33 or ASTM A1011 SS Grade 33) for thicknesses of 0.0179 inch (18 mils) (0.454 mm) through 0.1180 inch (118 mils) (3 mm), and a minimum 50,000 psi (345 MPa) yield point (ASTMA A 1003 SS Grade 50, Class 1 or 3, or ASTM A 1011 SS Grade 50) for thicknesses of 0.0538 inch (54 mils) (1.366 mm) through 0.1180 inch (118 mils) (3 mm).
 - 2. Section Properties are based upon the “Steel Stud Manufacturer’s Association” (SSMA) catalog of participating producers. (Per ICC-ES ER 4943P)
- C. Hangers:
 - 1. Stud Thicknesses: 12 gage (0.1046 thickness), 10 gage (0.1350 thickness), and 8 gage (0.1644 thickness) cold rolled steel.
- D. Carrying Channels: Cold rolled steel, 1-1/2” by 7/16” wide flange, 475 lbs. per 1000 lineal feet painted, 508 lbs. minimum per 1000 feet galvanized, unless otherwise noted on drawings.
- E. Furring Channels:
 - 1. Gypsum Board furring hat channels: “Screwable” 7/8” deep hat channels, (25 gage), 278 lbs. per 1000 feet painted.
 - 2. Cement Plaster furring channels: Cold rolled steel, 3/4” deep by 7/16” wide flanges, 316 lbs. minimum per 1000 feet galvanized channel shape.
- F. Gypsum Board “Zee” furring: Zee shaped 1” x 1-1/2” x 1-1/4” 25 gage galvanized steel concrete wall furring.

2.02 OTHER MATERIALS:

All other materials, not specifically described but required for a complete and proper installation of metal studs, shall be new, first quality, in strict accordance with recommendations of manufacturer of light gage metal framing used, and subject to approval of Architect.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Prior to installation of Light Gage Metal Framing, inspect the installed Work executed under other Sections which affect this installation.
- B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been corrected.
- C. Installation of Light Gage Metal Framing shall constitute acceptance of existing conditions.
- D. Inspection of welding per agency's T & I list.

3.02 COORDINATION:

Coordinate Work with Work specified under other Sections to ensure proper and adequate interface of Work.

3.03 PREPARATION:

Accurately lay out all partition and wall lines as dimensioned in the Contract Documents. Reasonable construction tolerances shall be considered acceptable within the existing structure.

3.04 STUD INSTALLATION:

- A. General: Install all metal studs and accessory items in strict accordance with the drawings, the approved submittal of manufacturer's recommendations and AISI approvals, anchoring all members in position for long life under hard use.
- B. Tolerances: Align all partition and wall assemblies to a tolerance of one in 200 horizontally and one in 500 vertically.
- C. Coordination:
 - 1. Space studs as required for compliance with all pertinent regulations, to give proper support for the facing material, and as indicated on the Drawings.
 - 2. Carefully coordinate all requirements for backing support of items to be mounted on finished walls.
 - 3. Carefully coordinate all requirements for pipes and other items designed to be housed within the partition and wall systems.

3.05 WIRE HANGER INSTALLATION: NOT APPLICABLE

- A. Attach wire hangers or brace wires to the construction above the specific ceiling. For each of the installations described below, execute the attachment in a manner which will insure the development of the full hanger or brace wire strength.
1. Attach wire hanger or brace wire in accordance with IR M-3 and IR M-4 and the drawings.

3.06 RUNNER INSTALLATION: NOT APPLICABLE

- A. Main runners shall be of the size and spacing for the distance between hangers (runner spans) as set forth in the following table:
1. Main runners should be spliced by lapping and interlocking flanges 12" minimum and tying near each end with double loops of No. 16 gage wire.
 2. Cross-furring should be spliced by lapping and interlocking the pieces 8" minimum and tying near each end with double loops of No. 16 gage wire.

MAXIMUM ALLOWABLE RUNNER SPANS

	SPACINGS				
MAIN RUNNERS	48"	42"	36"	30"	24"
3/4" C.R.C.	2'-0"	2'-6"	2'-6"
1-1/2" C.R.C.	3'-0"	3'-6"	4'-0"	4'-0"	5'-0"
2" C.R.C.	4'-6"	5'-0"	5'-0"	6'-0"	7'-0"

- B. Cross-furring shall be of the type and spacing for the distance between runners (furring spans) as set forth in the following table:

MAXIMUM ALLOWABLE FURRING SPANS

	SPACINGS			
CROSS-FURRING	24"	19"	16"	12"
3/8" Pencil Rod	...	2'-0"	2'-0"	2'-6"
3/4" C.R.C.	3'-0"	3'-6"	3'-6"	4'-0"

- C. Hanger wire shall be of the type and size for the area of ceiling supported as set forth in the following table. Wire to be galvanized, annealed.

MAXIMUM AREA SUPPORTED

TYPE HANGER	(sq. ft. per hanger)
12 Gage Wire	8.0
10 Gage Wire	12.0
9 Gage Wire	12.5
8 Gage Wire	16.0

3.07 SOUND PARTITIONS:

At all sound partitions, set floor runners in two 1/4 inch diameter continuous beads of caulking furnished and installed as prescribed in Section 07-900.

3.08 SMOKE BARRIER PARTITIONS:

At all smoke barrier partitions, set floor and ceiling runners in two 1/4 inch diameter continuous beads of caulking furnished and installed as prescribed in Section 07-900.

3.09 CLEAN UP:

Upon completion of this portion of the Work, promptly inspect all adjacent surfaces and repair damage caused by work under this Section, and remove all scrap and rubbish from the premises, in accordance with the provision of Section 01-700.

END OF SECTION

GYPSUM BOARD

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Gypsum Wallboard, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

08-100 METAL DOORS AND FRAMES
09-900 PAINTING

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

DITF Drywall Industry Trust Fund
GDCIA Gypsum Drywall Contractors International Association
ASTM American Society of Testing Materials

1.04 QUALITY ASSURANCE:

- A. Qualifications of Installers: Use only skilled and experienced gypsum board installers for laying up the gypsum board, fastening, taping, and finishing.
- B. Manufacturers' recommendations: The manufacturers recommended methods of installation, when approved by the Architect, shall be the basis for acceptance or rejection of actual installation methods used in this Work.
 - 1. Obtain each type of gypsum board and other panel products from a single manufacturer.
- C. Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to CSFM.

1.05 SUBMITTALS:

- A. Gypsum Board fastening schedule: Indicate type, size and spacing of fasteners for each type of framing and fire resistive condition.
- B. Two 24" x 24" samples for each type of finish.

PART 2 - PRODUCTS

2.01 GYPSUM PANELS:

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Gold Bond Building Products Division, National Gypsum Company.
 - 2. United States Gypsum Company.

- B. Gypsum Board:
1. Standard: In accordance with ASTM C 36
 2. Size: 5/8" inch thick by 4 foot wide maximum by practical height to minimize joints.
 3. Edge: Tapered.
 4. Type:
 - a. Regular for vertical & horizontal surfaces, unless otherwise indicated on the drawings.
 - b. Type X where required for fire-resistive-rated assemblies.
- C. Water-Resistant (WR) Gypsum Backing Board:
1. Standard: In accordance with ASTM C 630.
 2. Size: 5/8" inch by 4 foot wide maximum by practical height to minimize joints.
 3. Edge: Tapered.
 4. Type:
 - a. Regular for vertical & horizontal surfaces, unless otherwise indicated on the drawings.
 - b. Type X where required for fire-resistive-rated assemblies.
- D. Gypsum Sheathing Board:
1. Standard: In accordance with ASTM C 1396.
 2. Size: 5/8" inch by 4 foot wide maximum by practical height to minimize joints.
 3. Type: Fire-resistant board (type X)
 - a. A Gypsum Core Sheathing panel with additives to enhance the water repellent paper front, back, and long edges.
 - b. With additives in the core to enhance fire resistance.
- E. Impact – Resistant Gypsum Board Panels:
1. Meets ASTM C1396 and C1278; 5/8" thick type X.

2.02 SCREWS:

In accordance with CBC Section 2506, ASTM C954 or C1002, GDCIA, Gypsum Panel Manufacturer's recommendations and fire-rated design.

2.03 JOINT REINFORCEMENT TAPE AND JOINT COMPOUNDS:

- A. In accordance with ASTM C 475 and Gypsum Panel Manufacturer's recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
1. Joint Tapes:
 - a. Paper reinforcing tape, unless otherwise indicated.
 - b. Polymer-coated, open glass-fiber mesh for cementitious backer units.
 2. Setting-Type Joint compounds for gypsum board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

2.04 BASECOAT FOR DRYWALL

- A. Provide a basecoat for drywall after joint reinforcement and taping with joint compounds are done, but prior to any painting finish to be applied. Basecoat material shall be as follows:
1. "Prep Coat Plus" are manufactured by HAMILTON MATERIALS, INC. (714) 637-2770, or approved equivalent.

2.05 WATER RESISTANT SEALANT:

In accordance with Gypsum Panel Manufacturer's recommendation.

2.06 METAL ACCESSORIES:

- A. Corner Beads - 1-1/4" x 1-1/2" hot dipped galvanized metal equal to Dur-A-Bead #103 product of U.S. GYPSUM COMPANY, or approved equivalent.
- B. Edge Trim - 1 inch L-shaped, hot dipped galvanized metal equal to #200-B product of U.S. GYPSUM COMPANY, or approved equivalent.
- C. Edge Trim - 1 inch U-shaped, hot dipped galvanized metal equal to #200-A product of U.S. GYPSUM COMPANY, or approved equivalent.

2.07 GYPSUM BOARD FURRING CHANNELS:

Electro-Galvanized Resilient C (25 ga. X 7/8" x 2 3/4") DWC's with IB-1 Sound Isolation clips; and 16 ga. x 2" x 17/32" cold-rolled channel.

2.08 WATER:

All water used in joint system shall be clean, fresh, and free from deleterious amounts of foreign material.

2.09 OTHER MATERIALS:

All other materials, not specifically described but required for a complete and proper installation of gypsum board, shall be as selected by the Contractor subject to approval of the Architect.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Prior to installation of Gypsum Board, inspect the installed Work executed under other Sections which affect the installation of Gypsum Board.

3.02 INSTALLATION OF GYPSUM BOARD PANELS:

- A. Install in accordance with CBC Section 2506, GDCIA recommendations, Gypsum Panel Manufacturer's recommendations and in accordance with fire-rated design numbers indicated on drawings.
- B. Install Gypsum Panels horizontally on walls, floor to ceiling.
- C. Installation of Metal Accessories
 - 1. Corner Beads
 - a. Install at all exterior corners.
 - b. Install in one piece except when length of corner exceeds stock lengths.
 - 2. Edge Trim - Install at all exposed joints where Gypsum Panel abuts another material and as indicated on the drawings.
 - a. Provide joint sealer in accordance with Section 07-900.
 - 1. Provide fire caulking in accordance with Section 07-900, when the wall or ceiling is part of a fire rated situation.
- D. Taping & Finishing
 - 1. First Coat:
 - a. Spread compound evenly over all joints, using suitable tools designed for the purpose.

- b. Fill all joint recesses and metal trim.
 - c. Center the reinforcing tape on the joint and press into the fresh compound, wiping down with sufficient pressure to remove excess compound but leaving sufficient compound under the tape for proper bond.
 - d. Feather all edges and leave the surface free from blisters and tape wrinkles.
 - e. Apply compound to all fastener recesses, leaving flush with the adjacent surfaces.
 - f. Fold reinforcing tape along its centerline and apply to all interior angles, following the same procedure as for joints.
 2. Second Coat:
 - a. Lightly sand the dry compound with fine sandpaper to remove all irregularities.
 - b. Apply a second coat of compound to all joints, feathering approximately three inches beyond edges of type.
 - c. Apply second coat to all fastener recesses.
 3. Third Coat:
 - a. Lightly sand the dry compound with fine sandpaper to remove irregularities.
 - b. Apply final skim coat, feathering out approximately two inches beyond second coat.
 - c. Third coat fastener recesses and metal trim, and all interior angles; allow to dry.
 4. Apply a basecoat material ("Prep Coat Plus") at approximately 200 sq. ft. per gallon for all painted wall surfaces. Follow manufacturer's recommendations for proper preparation of material, mixing and installation.
 - a. For smooth walls with no texture, provide airless sprayer application in accordance with manufacturer's recommendations. Fine finish sand wall surface with 220 grit mesh screen. **Do not oversand!**
 - b. For textured walls, provide roller application with a 1/4" to 3/8" nap roller before texture application is applied in accordance with manufacturer's recommendations.
- F. Cutting:
1. When cutting gypsum board is required, cut by scoring and breaking or by sawing, working from the face side.
 2. When cutting by scoring, cut through the face paper and then snap the panel back away from the cut face; then break the backpaper by snapping the gypsum board in the reverse direction or by cutting the back paper.
 3. Smooth all cut ends and edges of panels as necessary to obtain a smooth joint.
 4. For cut-outs by sawing or by such other method as will not fracture the core or tear the covering and with such accuracy that plates, escutcheons, or trim will cover the edges.
 5. The use of "score-and knockout" method will not be permitted.
- G. Fastening:
1. Properly space all fasteners in careful accordance with the manufacturer's recommendations and code requirements, with heads driven slightly below the surface for proper cementing but without breaking the paper cover.
 2. Loosely butt all joints to be taped; firmly butt all joints to be left untreated.
 3. Stagger all end joints and the joints between panels to achieve a maximum of bridging and a minimum of continued joints.

- H. Ceilings:
 - 1. At those areas where gypsum board ceiling is indicated on the Drawings, and where it is possible to do so, install the ceiling prior to installing walls.
 - 2. Where possible, and where permitted by code, float the interior ceiling angles.
- I. Sound Isolation Walls:
 - 1. At all sound isolation walls, set all gypsum panels on each side of the partition on a continuous 1/4 inch bead of sealant furnished and installed in accordance with the provisions of Section 07-900 of these Specifications.

3.03 INSTALLING METAL TRIM:

- A. General: The Drawings do not purport to show all metal trim required; verify with the Architect the precise locations and types of trim to be used.
- B. Installation:
 - 1. Carefully inspect the Drawings and verify location of all metal trim required.
 - 2. Install at trim in strict accordance with the manufacturers' recommendations, paying particular attention to make all trim installations plumb, level, and true to line, with firm attachment to supporting members.

3.04 WATER RESISTANT BOARD:

- A. Install where required by drawings and in all areas where high moisture conditions are present or ceramic tile or plastic finished paneling is scheduled over gypsum board.
- B. In all areas to be tiled, treat all edges, cutouts, utility holes and joints, corners and nailheads with approved sealant material in lieu of standard taping. Joints not to be covered by tile shall be treated as regular gypsum board. Do not use standard joint compound under ceramic tile.

3.05 CLEANING:

In accordance with Section 01-700, Cleaning.

3.06 SCHEDULE OF FINISHES:

The following finishes shall be applied to the board surfaces within the scope of this section. Refer to the Material and Finish Schedule for specific locations of each finish. Where no specific finish is called for on the drawing, G B-1 below shall apply.

- G B-1 After basecoat application and cure time in accordance with basecoat manufacturer's recommendations, provide special prepaint texture as selected by Architect: spray-spatter, orange peel, stipple or skip trowel. Submit samples of selected texture(s). The amount of sanding of final joint topping may be varied to accommodate the selected texture.
- G B-2 When gypsum board is scheduled to be covered with vinyl wall covering, acoustic tile or similar materials, sanding may be omitted, except total surface must be sufficiently smooth to present a good bonding plane for applied materials. Rough tape only to achieve fire rating. A "V" joint gypsum backing board may be used in these locations if approved by applicable codes.

END OF SECTION

TILE

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment and services necessary to furnish and install Tile, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
03-300	CAST-IN-PLACE CONCRETE
06-100	ROUGH CARPENTRY
07-900	JOINT SEALERS
09-100	LATH AND PLASTER
09-250	GYPSUM WALLBOARD

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

TCA Tile Council of America, "Handbook for Ceramic Tile Installation", latest edition.

1.04 SUBMITTALS:

- A. Submit the following in accordance with Section 01-300 SUBMITTALS:
1. Product Data.
 - a. If not indicated in Drawings, provide layout of all movement joints for Architect's review.
 2. Colors.
 3. Samples.
 4. Maintenance Materials: In accordance with 01-700, PROJECT CLOSEOUT. Supply 2 square feet of tile and 3 lineal feet of trim for each color and pattern of tile.

1.05 PRODUCT HANDLING:

- A. Delivery: In manufacturer's original unopened containers with labels indicating brand name, type, color and pattern.

1.06 JOB CONDITIONS

- A. Environmental Requirements:
1. Maintain temperature in space to receive ceramic tile above 50 degrees F for 3 days prior, during and 7 days following installation.

1.07 WARRANTY:

- A. In accordance with Section 01-740, WARRANTIES.

PART 2 - PRODUCTS

2.01 TILE:

- A. Grade: Standard Grade in accordance with ANSI A137.1-1988.
1. All floor tile shall comply with the slip resistance standards required by the ADA, with a minimum Static Coefficient of Friction (C.O.F.) of 0.6 when wet.
 2. Acceptable Manufacturers are AMERICAN OLEAN, BUCHTAL, DAL-TILE, or approved equivalent.
 - a. Tile Types listed herein establish the size and color range selected by the Architect for this Project. Manufacturer's listed as acceptable must comply with the size and color range specified to be approved as an equivalent.
- B. Types:
1. CT-1: Unglazed Ceramic Floor Tile
 - a. Design: 2 x 2 inch
 - b. Material: Unglazed impervious porcelain ceramic floor tiles.
 - c. Color: To be selected from manufacturer's full range of solid and medly colors, DALTILE KEYSTONES/KEYSTONE BLENDS Series, Groups I thru V, or approved equivalent.
 2. CT-2: Glazed Ceramic Wall Tile:
 - a. Design: 4-1/4 x 4-1/4 inch.
 - b. Material: Glazed interior wall tile, trim to match.
 - c. Color: To be selected from manufacturer's full range of Matte and Semi-gloss Series colors, DALTILE, or approved equivalent.
 - d. Base: Use 4-1/4 x 4-1/4 inch coved base at full height and wainscot glazed wall tile when all walls receive tile. Use 6 x 4-1/4 inch coved base at full height tile walls and base at wainscots when isolated walls receive tile walls and wainscots.
 3. CT-3: Glazed Ceramic Wall Tile:
 - a. Design: 2 x 2 inch.
 - b. Material: Glazed interior wall tile, trim to match.
 - c. Color: To be selected from manufacturer's full range of glaze colors, DAL-TILE's "Semi-gloss/Crystaltex" Series, or approved equivalent.
 - d. Base: Use 2 x 2 inch coved base at full height and wainscot glazed wall tile when all walls receive tile. Use 6 x 4-1/4 inch coved base at full height tile walls and base at wainscots when isolated walls receive tile walls and wainscots.
 4. CT-4: Glazed Ceramic "Accent" Wall Tile:
 - a. Design: 2 x 2 inch .
 - b. Material: Glazed interior accent wall tile, trim to match.
 - c. Color: To be selected from the manufacturer's full range of accent glaze colors. DAL-TILE's Groups Semi-gloss/Crystaltex series, or approved equivalent.
 5. CT-5: Unglazed Quarry Floor Tile:
 - a. Design: 6 x 6 x 1/2 inch.
 - b. Unglazed semi-vitreous shale-clay tiles.
 - c. Color: To be selected from manufacturer's full range, AMERICAN OLEAN's "Quarry Natural".

6. CT-6: Glazed Ceramic Accent Wall Tile:
 - a. Design: 4 x 4 inch.
 - b. Material: Glazed accent wall tile.
 - c. Color: To be selected from the manufacturer's full range of glaze colors, BUCHTAL's "Chroma Series", including the "Intensive" colors.
 7. CT-7: Unglazed Ceramic Floor Tile
 - a. Design: 2" x 2".
 - b. Material: Unglazed impervious ceramic mosaic floor tiles.
 - c. Color: To be selected from manufacturer's full range of ceramic mosaic colors, AMERICAN OLEAN, with accent colors "A" and "B", or approved equivalent.
 - d. Base: 5 inch (2" x 2" x 1" cove) radius top at base only condition.
 - e. Base: 5 inch (2" x 2" x 1" cove) at ceramic tile walls and wainscots.
 8. CT-8: Glazed Ceramic Wall Tile:
 - a. Design: 2" x 2".
 - b. Material: Interior glazed ceramic wall tile.
 - c. Color: To be selected from manufacturer's full range of matte glaze colors, AMERICAN OLEAN's "Satinglo", or approved equivalent. Colors to be coordinated with unglazed ceramic mosaic floor tile and base.
- C. Tile Trim Units: Provide tile trim units to match characteristics of adjoining flat tile.

2.02 SETTING MATERIALS:

- A. Portland Cement: In accordance with ASTM C-150, Type 1.
- B. Aggregate (Sand): In accordance with ASTM C-144.
- C. Hydrated Lime: In accordance with ASTM C-207, Type S.
- D. Water: Clean and free from deleterious amounts of acids, alkalis, salts or organic material.
- E. Organic Adhesive: In accordance with ANSI A-136. 1-85, Type 1. For areas requiring prolonged water resistance, provide primer/sealer as recommended by the tile manufacturer.
- F. Dry-Set Portland Cement Mortar: In accordance with ANSI A118. 1-85.
- G. Latex-Portland Cement Mortar: In accordance with ANSI A118.4-85.

2.03 GROUT MIXES:

- A. Sand-Portland Cement Grout: One part Portland Cement to one part fine graded sand.
- B. Commercial Cement Grout: Portland Cement with ingredients to produce a water resistant, dense, uniformly colored material. Mix in accordance with manufacturer's instructions.
 1. Silicone grout shall not be used on kitchen countertops or other food preparation surfaces unless it meets the requirements of FDA Regulation No. 21, CFE 177.2600.
- C. Dry-Set Grout: A mixture of Portland Cement with sand and additives imparting water retentivity in accordance with ANSI A108.5-85 and ANSI A118.1-85.

2.04 LATEX ADMIXTURE:

- A. Shall be Grout and Mortar Latex Admix No. 3701 as manufactured by LATICRETE INTERNATIONAL, INC.

2.05 CURING SHEET:

- A. Laminated, reinforced Kraft paper with a bituminous binder or 0.002 inch minimum polyethylene sheet.

2.06 CLEANER:

- A. Detergent consisting primarily of tri-sodium phosphate.

2.07 OTHER MATERIALS:

- A. All other materials, not specifically described but required for a complete and proper tile installation, shall be as selected by the Contractor subject to approval of the Architect.

2.08 SEALANTS

- A. Silicone Rubber in accordance with 07-900 for all interior and exterior application - color to match grout.
- B. Polyurethane in accordance with 07-900 for all “foot traffic” expansion joints. Provide “shore” factor of 35 or greater.

2.09 CLEAVAGE MEMBRANE

- A. “Chloraloy” by THE NOBLE COMPANY, or approved equivalent, at shower floor areas adjacent to wood or metal stud wall areas.
- B. Polyethylene, 6 mil sheet with 6 inch laps at shower floor areas adjacent to concrete or masonry wall areas.

2.10 WALL MEMBRANE

- A. Polyethylene, 4 mil sheet with 6 inch laps at wet areas.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Prior to installation of Ceramic or Quarry Tile, inspect the installed work executed under other Sections which affect the installation of Tile.
- B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been corrected.
- C. Installation of Tile shall constitute acceptance of existing conditions.

- D. Maximum backing surface variation shall be as follows:
1. For Organic Adhesive at walls: 1/8 inch to 8 feet from required plane.
 2. For Mortar Bed at Floors: 1/4 inch in 10 feet from required plane.

3.02 COORDINATION:

Coordinate Work with related items specified under other Section to ensure proper and adequate interface of Work.

3.03 LAYOUT:

- A. Determine location of all movement joints before starting tile work.
1. Sizes:
 - a. Working Butt Joints - 1/4 inch minimum.
 - b. Working Lap Joints - 1/8 inch minimum.
 2. Frequency:
 - a. Exterior - 16 feet on center, unless otherwise shown on drawings.
 - b. Interior - 16 feet on center, unless otherwise shown on drawings.
- B. Determine location of all toilet accessories before starting tile work.
- C. Lay out all tile work to minimize cuts less than on-half in size.
- D. Lay out tile wainscots to next full tile beyond dimension shown.
- E. Align all wall joints to give straight uniform grout lines, plumb and level.
- F. Align all floor joints to give straight uniform grout lines, parallel with walls.
- G. All Joints shall be uniform in width.
- H. Sanitary Coved Base (slim foot) at base of wall.

3.04 INSTALLATION OF TILE:

- A. SYS-A: System A - Gypsum Wallboard on Metal Studs, Interior Wall.
1. Use: Dry or limited water exposure (Toilets).
 2. Method: Organic Adhesive.
 3. Detail Standard: TCNA W242-92 - Solid backing, adhesive, tile.
 4. Installation Standard: ANSI A108.4/A108.10.
- B. SYS-B: System B - Metal Studs, Interior Wall.
1. Use: Dry or wet (Kitchen and Toilets).
 2. Method: Cement Mortar.
 3. Detail Standard: TCNA B411-07 - Wall membrane, metal lath, scratch coat, mortar bed, bond coat, tile.
 4. Installation Standard: ANSI A108.1/A108.5/A108.10.
- C. SYS-C System C - Concrete Sub-Floor Interior Floor.
1. Use: Dry or Wet (Kitchens and Toilets).
 2. Method: Cement Mortar, Bonded
 3. Detail Standard: TCNA B421-07 - Mortar bed bond coat, 3/4 to 1-1/4 inch mortar bed, bond coat, tile.
 4. Installation Standard: ANSI A108.5/A108.10.

- D. SYS-D: System D - Masonry, Interior Wall.
 - 1. Use: Dry or Limited water exposure (Toilets).
 - 2. Method: Cement Mortar, Bonded.
 - 3. Detail Standard: TCNA W211-92 - Masonry, mortar bed, bond coat, tile.
 - 4. Installation Standard: ANSI A108.5/A108.10.

- E. SYS-E: System E - Wood Stud Wall.
 - 1. Use: Dry or Wet.
 - 2. Method: Cement Mortar.
 - 3. Detail Standard: TCNA W231-92 - Wall membrane, metal lath, scratch coat, mortar bed, bond coat, tile.
 - 4. Installation Standard: ANSI A108.1/A108.10

- F. SYS-F: System F - Masonry or Concrete Walls.
 - 1. Use: Dry or Wet.
 - 2. Method: Cement Mortar.
 - 3. Detail Standard: TCNA W211-07 - Wall membrane, metal lath, scratch coat, mortar bed, bond coat, tile.
 - 4. Installation Standard: ANSI A108.1/A108.10.

- G. SYS-G: System G - Interior Concrete Sub-floor.
 - 1. Use: Dry or Limited water exposure.
 - 2. Method: Dry-set or latex-PC Mortar.
 - 3. Detail Standard: TCNA F113-92 - Bond coat, thinset mortar, tile.
 - 4. Installation Standard: ANSI A108.5/A108.10.

- H. SYS-H: System H - Masonry or Concrete Walls.
 - 1. Use: Dry or Wet.
 - 2. Method: Cement Mortar.
 - 3. Detail Standard: TCA W202-90 - Metal lath, scratch coat, mortar bed, bond coat, tile.
 - 4. Installation Standard: ANSI A108.5/A108.10.

- I. Isolate tile installation from concrete slabs at shower floor areas to minimize cracking of the tile installation systems. Install in accordance with the TCA recommendations using cleavage membranes.

- J. SYS-J: System J – Cement backer board on wood stud wall, Interior Wall.
 - 1. Use: Dry or wet.
 - 2. Method: Portland Cement Mortar
 - 3. Detail Standard: TCNA W244-97 – Wall membrane, Cementitious backer Unit, Portland Cement Mortar Bond Coat, Tile.

3.05 CURING:

- A. Apply Curing Sheet over tiled surfaces.
- B. Lap sheets 4 inches minimum and seal against escape of moisture.
- C. Leave Curing Sheets in place a minimum of 3 days.

3.06 CLEANING:

- A. In accordance with Section 01-700, PROJECT CLOSEOUT.

- B. Wash down cured tile work with cleaner mixed and applied in accordance with manufacturer's instructions.
- C. Rinse tile work thoroughly with clean water and polish with soft cloth.

3.07 PROTECTION:

- A. Prohibit all foot and wheel traffic from using newly tiled floor for at least 3 days.
- B. Relay Curing Sheet after cleaning.

END OF SECTION

ACOUSTICAL CEILINGS AND SUSPENSION SYSTEMS

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Acoustical Ceilings, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
06-100	ROUGH CARPENTRY
06-200	FINISH CARPENTRY
07-200	BUILDING INSULATION
10-050	MISCELLANEOUS SPECIALTIES
DIV. 15	MECHANICAL
DIV. 16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

AIMA	Acoustical and Insulating Materials Association - Latest Edition.
CISCA	Ceilings & Interior Systems Construction Association
USDA	United States Department of Agriculture

1.04 SUBMITTALS:

- A. Submit one sample tile of each type of Acoustical Tile scheduled to be used in this Project.
- B. Submit samples of Suspension System Runners for each type specified or scheduled.
- C. Provide approved drawing for ceiling bracing in compliance with CBC (4 copies).
- D. Maintenance Material: Acoustical Tile quantity equal to 1% of each type, but not less than one carton (48 tiles) of each-type.

1.05 DELIVERY AND STORAGE:

Deliver materials in original unopened packages with manufacturer's name and contents legibly indicated and store in properly protected area.

1.06 JOB CONDITIONS:

Acoustical Ceiling shall not be installed until the conditions are in accordance with "Job Conditions" AIMA, CISCA, and USDA (if applicable).

PART 2 - PRODUCTS

2.01 ACOUSTICAL TILE: (See drawings for specific type used)

- A. The schedule herein was prepared in 2012, and was compliant with ARMSTRONG WORLD INDUSTRIES' product item numbers at that time. Installer will provide products compliant with ARMSTRONG WORLD INDUSTRIES' product item numbers at the time of installation, and will inform the Architect of any changes effected by the manufacturer in regards to availability as part of his submittal process.
- B. An acceptable manufacturer is CELOTEX & USG. Submittals by these manufacturers, subject to specification requirements, must be in accordance with Section 01-300, SUBMITTALS.
1. Review of manufacturer's submittals will be checked against the performance requirements and the aesthetic appearance of the tiles or panels listed in the schedule. Should the submitted tile or panel not be in compliance with the specifications section as determined by the Architect, than the Contractor shall provide the product specified.
 2. Other manufacturers not listed shall submit in accordance with Section 01 -640, SUBSTITUTIONS.
- C. Type ACT-I:
1. Design: "Sanserra Design: No. 571, Travertone/Travertone Tile as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Embossed wet-formed mineral fiber, with a factory-applied vinyl latex paint.
 3. Size:12" x 12" x 3/4" tile - "Square Cut" edge (K4C4).
 4. Mounting:Adhesively applied over 5/8 inch gypsum board.
 5. NRC Range:0.60 - 0.70.
 6. CSTC Range:35 - 39.
 7. Light Reflectance:LR 0.65 (65%) minimum per ASTM E 1264.
 8. Flame Spread Index:Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- D. Type ACT-II ("Fire Guard" is a fire resistive ceiling when used in applicable UL fire resistive designs):
1. Design: "Sanserra Design" No. 515, Travertone/Travertone "Fire Guard" Tile as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Embossed wet-formed mineral fiber, with a factory-applied vinyl latex paint.
 3. Size:12" x 12" x 3/4 tile - Square Cut" edge (K4C4).
 4. Mounting:Adhesively applied over 5/8 inch Type "X" gypsum board.
 5. NRC Range:0.60 - 0.70.
 6. CSTC Range:35 - 39.
 7. Light Reflectance:LR 0.65 (65%) minimum per ASTM E 1264.
 8. Flame Spread Index:Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- E. Type ACT-III:
1. Design: "Cortega Design: No. 745, Minatone/Minatone Tile as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Wet-formed mineral fiber, with a factory-applied vinyl latex paint.

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3. Size:.....12” x 12” x 5/8” tile - Beveled” edge (K4C4).
4. Mounting:.....Adhesively applied over 5/8 inch gypsum board
5. NRC Range:0.50 - 0.60.
6. CSTC Range:.....35 - 39.
7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
8. Flame Spread Index:Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
10. Color:White available only.

F. Type ACT-IV (Nonperforated tiles have USDA acceptance as ceiling tiles for incidental food contact):

1. Design: “Nonperforated Acousti-Clad” No. 749 Tile, as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
2. Material: Wet-formed mineral fiber, with a baked on high-molecular weight resin finish on an aluminum membrane.
3. Size:12” x 12” x 5/8” tile - Beveled” edge (K4C4).
4. Mounting:Adhesively applied over 5/8 inch gypsum board.
5. NRC Range:N/A.
6. CSTC Range:40 44.
7. Light Reflectance:.....LR 0.75 (75%) minimum per ASTM E 1264.
8. Flame Spread Index:Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
10. Color:White available only.

G. Type ACT-IV:

1. Design: “Perforated Acousti-Clad” No. 750 Tile, as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
2. Materials: Wet-formed mineral fiber, with a baked on high-molecular weight resin finish on an aluminum membrane.
3. Size:12” x 12” x 5/8” tile - Beveled” edge (K4C4).
4. Mounting.....Adhesively applied over 5/8 inch gypsum board.
5. NRC Range:0.45 - 0.55.
6. CSTC Range:40 44.
7. Light Reflectance:LR 0.70 (70%) minimum per ASTM E 1264.
8. Flame Spread Index:Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
10. Color:White available only.

H. Type ACT-V:

1. Design: “Fine Fissured Design: No. 1820 & 1824, Tegular High Acoustics Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
2. Material: Embossed wet-formed mineral fiber, with a factory-applied vinyl latex paint.
3. Size:24”x48” & 24” x 24” x 3/4” panel - “Angled Tegular” regular lay-in edge.
4. Mounting:15/16” exposed tee grid.
5. NRC Range: 0.70.
6. CSTC Range: 40
7. Light Reflectance:LR 0.85 (85%) minimum per ASTM E 1264.
8. Flame Spread Index:Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
10. Color:White available only.

- I. Type ACT-VI:
1. Design: "Suprafine 4200 Design" No. 2831, Travertone Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Embossed wet-formed mineral fiber, with a factory-applied vinyl latex paint.
 3. Size:24" x 24" x 3/4" panel - "Angled" regular lay-in edge.
 4. Mounting:15/16" exposed tee grid.
 5. NRC Range:0.50.
 6. CSTC Range:35 - 39.
 7. Light Reflectance:LR 0.80 (80%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color: (Field painted).....White available only.
- J. Type ACT-VII:
1. Design: "Fissured Design" No. 755, Minaboard/Minaboard Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Wet-formed mineral fiber, with a factory-applied vinyl latex paint.
 3. Size:24" x 48" x 5/8" panel - "Square Cut" lay-in edge.
 4. Mounting:15/16" exposed tee grid.
 5. NRC Range:0.50 - 0.60.
 6. CSTC Range:40 - 44.
 7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- K. Type ACT-VIII: ("Fire Guard" is a fire resistive ceiling when used in applicable UL fire resistive designs):
1. Design: "Fissured Design" No. 895, Minaboard/Minaboard "Fire Guard" Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Wet-formed mineral fiber, with a factory-applied vinyl latex paint.
 3. Size:24" x 48" x 5/8" panel - "Square Cut" lay-in edge.
 4. Mounting:15/16" fire-rated exposed tee grid.
 5. NRC Range:0.50 - 0.60.
 6. CSTC Range:40 - 44.
 7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- L. Type ACT-IX: ("Fire Guard" is a fire resistive ceiling when used in applicable UL fire resistive designs):
1. Design: "Cortega Design" No. 823, Minaboard/Minaboard "Fire Guard" Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Wet-formed mineral fiber, with a factory-applied vinyl latex paint.
 3. Size:24" x 48" x 5/8" panel - "Square Cut" lay-in edge.
 4. Mounting:15/16" fire-rated exposed tee grid.
 5. NRC Range:0.50 - 0.60.
 6. CSTC Range:40 - 44.

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7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- M. Type ACT-X: (“Fire Guard” is a fire resistive ceiling when used in applicable UL fire resistive designs):
1. Design: “Armashield” No. 821, “Fire Guard” Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Wet-formed mineral fiber, with a factory-applied polymeric membrane.
 3. Size:24” x 48” x 3/4” panel - “Square Cut” lay-in edge.
 4. Mounting:15/16” fire-rated exposed tee grid.
 5. NRC Range:0.55 - 0.65.
 6. CSTC Range:40 - 44.
 7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- N. Type ACT-XI: (“Fire Guard” is a fire resistive ceiling when used in applicable UL fire resistive designs. Nonperforated tiles have USDA acceptance as ceiling tiles for incidental food contact):
1. Design: Nonperforated “Plain Ceramaguard” No. 605, “Fire Guard” Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Ceramic and mineral fiber composite, with a factory-applied vinyl plastic paint capable of withstanding 10,000 scrub cycles in accordance with AIMA IB Specification No. 7, May 1971.
 3. Size:24” x 48” x 5/8” panel - “Square Cut” lay-in edge.
 4. Mounting:15/16” fire-rated exposed tee grid.
 5. NRC Range:0.50 - 0.60.
 6. CSTC Range:40 - 44.
 7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84.
 10. Color:White available only.
- O. Type ACT-XII: (“Fire Guard” is a fire resistive ceiling when used in applicable UL fire resistive designs).
1. Design: Perforated “Travertine Ceramaguard” No. 602, “Fire Guard” Panel as manufactured by ARMSTRONG WORLD INDUSTRIES, INC.
 2. Material: Ceramic and mineral fiber composite, with a factory-applied vinyl plastic paint capable of withstanding 10,000 scrub cycles in accordance with AIMA IB Specification No. 7, May 1971.
 3. Size:24” x 48” x 5/8” panel - “Square Cut” lay-in edge.
 4. Mounting:15/16” fire-rated exposed tee grid.
 5. NRC Range:0.50 - 0.60.
 6. CSTC Range:40 - 44.
 7. Light Reflectance:LR 0.75 (75%) minimum per ASTM E 1264.
 8. Flame Spread Index: Class I (CBC Table 8-A) per ASTM E 84 (CBC Sec. 803.1) with a Flame Spread of 25 or under.
 9. Smoke Density Developed Index:10 in accordance with ASTM E 84
 10. Color:White available only

2.02 SUSPENSION SYSTEM:

- A. Standard - Heavy Duty in accordance with ASTM C 635, & 636 CBC 1616A.1.21, and IR 25.2-13.

- B. Exposed Tee Grid System as manufactured by CHICAGO METALLIC CORPORATION, or approved equivalent. All exposed tee grid system numbers are by CHICAGO METALLIC CORPORATION:
 - 1. Exposed Tee Grid System:.....1200 System
 - 2. Fire Rated Exposed Tee Grid System.....Fire Front 1250 System
 - 3. Main Runner:
 - a. Non-rated.....200
 - b. Rated.....270
 - 4. Cross Tee
 - a. 2' non-rated tee grid system.....1228
 - b. 4' non-rated tee grid system.....1214
 - c. 2' fire-rated tee grid system.....1254
 - d. 4' fire-rated tee grid system.....1274
 - 5. Edge Trims: Seismic RX clips BERG 2 with edge trim below.
 - a. "Shadow Line" Ceiling Edge Trim: 3/4" x 3/8" x 3/8" x 3/4" metal edge trim. Gage same as main runners. This is the typical edge trim for most ceiling systems.
 - b. "Angle" edge trim with hemmed edges: 3/4 x 15/16" angle trim, gage the same as the main runners, locations as shown on the drawings.

- C. Hangers and Brace Wires - 12 gauge galvanized, soft annealed, mild steel wire.

- D. Lateral Bracing - Refer to Drawings, ASTM E580 and IR IR 25.2-13.
- E. Exposed Finish - White Enamel Paint.

2.03 ADHESIVE: Applicable at 12 x 12 tile glued to acoustical gypsum board.

- A. Adhesive shall comply with all requirements of ASTM D 1779 and shall be compatible with the sub-strate to which the tile is installed as well as the tile material selected.

PART 3 - EXECUTION

3.01 COORDINATION:

Coordinate Work with Work performed in other Sections of the General Specification, DIVISION 15, and DIVISION 16 to assure proper placement of ceiling mounted tracks, accessories, light fixtures, A/C registers and other items which are to be integrated with the Suspended Acoustical Ceilings.

3.02 INSTALLATION SUSPENDED ACOUSTICAL CEILINGS:

- A. Installation shall be in accordance with:
 - 1. ASTM C 635
 - 2. ASTM C 636
 - 3. AIMA, CISCA, and USDA (if applicable).
 - 4. Manufacturer's recommendations
 - 5. ASTM E580 and IR 25.2-13.

- B. Suspension of Grid Systems for School Buildings
1. 12 ga. (min.) hanger wires may be used for up to and including 4'0" x 4'0" grid spacing along main runners. Splices will not be permitted in any hanger wires unless specifically approved by DSA/SSS.
 2. Provide 12 ga. hanger wire at ends of all main and cross runners within 8" from the support or within 1/4" of the length of the end tee, whichever is least, for the perimeter of the ceiling area. End connections for runners which are designed and detailed to resist the applied horizontal forces may be used in lieu of the 12 ga. hanger wires subject to DSA/SSS review and approval.
 3. Provide trapeze or other supplementary support members at obstructions to maintain hanger spacing. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas. Hanger wires that are more than 1 in 6 out of plumb are to have counter-sloping wires.
 4. Ceiling grid members may be attached to not more than 2 adjacent walls. Ceiling grid members should be at least 3/4 inch free of other walls. If walls run diagonally to ceiling grid system runners, one end of main and cross runners should be free and a minimum of 3/4 inch clear of wall. Pop rivets, screws, or other attachments in fire-rated ceilings shall not be acceptable unless specifically detailed on the drawings and approved by UL and DSA//FLS.
 5. At the perimeter of the ceiling area where main or cross runners are not connected to the adjacent wall, provide interconnection between the runners at the free end to prevent lateral spreading. A metal strut or a 16 ga. wire with a positive mechanical connection to the runner may be used. Where the perpendicular distance from the wall to the first parallel runner is 12" or less, this interlock is not required.
 6. Provide sets of four (4) #12 ga. splayed bracing wires oriented 90 degrees from each other spaced not more than 12 feet by 12 feet on center (144 sf). Provide compression Struts as indicated on the drawings at splay wire locations. Splay wires shall be located not more than 1/2 the above spacing from each perimeter wall or at the edge of vertical ceiling offsets. The slope of these wires should not exceed 45 degrees from the plane of the ceiling and should be taut without causing the ceiling to lift. Splices in bracing wires are not permitted unless specifically approved by DSA/SSS.
 7. Fasten hanger wires with not less than 3 tight turns. Fasten bracing wires with 4 tight turns. Make all tight turns within a distance of 1-1/2 inches. Hanger or bracing wire anchors to the structure should be installed 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.
 8. 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" nominal diameter, to hanger wires using connectors acceptable to DSA/SSS.
 9. Attach all light fixtures to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures.
 10. All flush or recessed light fixtures and air terminals or services weighing 56 pounds or more must be independently supported by not less than four (4) taut #12 ga. wires capable of supporting 4 times the weight of the fixture and attached to the structure above regardless of the type of ceiling grid system used. Items weighing less than 56 pounds may be supported on the runners of a heavy duty grid system but, in addition, they must have a minimum of two (2) #12 ga. slack safety wires attached to the fixture at diagonal corners and anchored to the structure above. All 4 ft. x 4 ft. fixtures must have slack safety wires at each corner.
 11. Install lateral Bracing as indicated on Drawings and as required by the provisions of CBC.

12. Suspend Grid System at elevations indicated on the Drawings.
13. Ceiling Edge Condition:
 - a. Where Grid System abuts wall, fasten ceiling edge trim to wood in wall structure with 6d nails at 16 inches on center maximum. Grid system to be in contact with (rest on) ceiling edge trim. Fasten grid system to ceiling edge trim at two adjacent walls. At non-fastened walls, tie grid system runners per Paragraph 3.02 B.5 above.
 - b. Where Grid System terminates free from wall, fasten ceiling edge trim to Grid system with Fasteners. No screw or rivets shall appear on any exposed surface.

3.03 **INSTALLATION OF ADHESIVE APPLIED ACOUSTICAL TILE CEILINGS:**

- A. Installation shall be in full conformance to the manufacturer's recommendations, ASTM D 1779 and AIMA specifications for #1 suspension system.

3.04 **CLEANING AND TOUCH-UP:**

- A. Clean surfaces where soiled.
- B. Touch up where scratched or scuffed with appropriate paint supplied by manufacturer.
- C. Any defective, soiled or improperly installed components which cannot be satisfactorily corrected shall be replaced with new materials.

END OF SECTION

RESILIENT TILE FLOORING

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Resilient Tile Flooring, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
03-300	CAST-IN-PLACE CONCRETE (concrete subfloor)
06-200	FINISH CARPENTRY
06-412	MODULAR CASEWORK
10-050	MISCELLANEOUS SPECIALTIES

1.03 STANDARDS:

In accordance with 01-080 Codes and Standards, and the following:

AQMCD Air Quality Management Control District, in the location where the Project is located.

1.04 SUBMITTALS:

- A. Samples: In accordance with Section 01-300, Product Submittals.
- B. Color: In accordance with Section 01-300, Product Submittals.
- D
- C. Operations Data: In accordance with 01-700, Project Closeout.
- D. Maintenance Materials: 2% or 10 square feet minimum of each color and pattern used on the project in accordance with Section 01-700.

1.05 PRODUCT HANDLING:

- A. Delivery:
 - 1. In manufacturer's original unopened containers with legible labels indicating manufacturer's name and contents.

1.06 JOB CONDITIONS:

- A. Environmental Conditions:
 - 1. Maintain a constant temperature of 70 degrees Fahrenheit for 48 hours after installation. A minimum of 55 degrees Fahrenheit shall be maintained thereafter.

PART 2 - PRODUCTS

2.01 VINYL TILE:

- A. Type: Azrok VCT Series (1/8" x 12" x 12"); Tarkett Group colors as selected by Architect from manufacturer's full line of colors, or approved equivalent. Coefficient of friction 0.6 minimum.
- B. B Type: Mohawk Group Select Step 11 Wood CR 703 Series Enhanced Resilient Tile (1/8" x 7" x 48") colors as selected by Architect from manufacturer's full line of colors, or approved equivalent. Coefficient of friction 0.6 minimum. Install per manufacturer's recommendation.

2.02 RUBBER FLOOR TILE:

- A. Type: Raised Rubber Floor Tile, # 994 Raised Square Design, manufactured by ROPPE CORPORATION, color as selected by Architect from manufacturer's full line of colors, or approved equivalent. Shall conform to ASTM F-1344, class 1.

2.03 RUBBER BASE:

- A. Type: Rubber Topset Base as manufactured by BURKE FLOORING PRODUCTS, color as selected by Architect from manufacturer's full line of colors, or approved equivalent.
 - 1. Height: 4 inches.
 - 2. Thickness: 1/8 inch.

2.04 RUBBER STAIR TREADS & ACCESSORIES

- A. Provide and install rubber stair treads, risers and skirting "Rouleau" series with 2" visually impaired strip as manufactured by BURKE FLOORING PRODUCTS, color as selected by Architect from manufacturer's full line of colors or approved equivalent.

2.05 TRANSITIONAL MOULDINGS AND ACCESSORIES:

- A. Inside and outside base corners to match Rubber Topset Base.
- B. Flooring Transitional Mouldings as manufactured by MERCER PRODUCTS COMPANY. Color and type as selected by Architect from manufacturer's full product line of types and colors, or approved equivalent. Install pinless metal track and snap-in T vinyl moulding at flooring transitions.

2.06 ADHESIVE:

Adhesive as recommended by base and tile manufacturer, in accordance with AQMCD requirements in the place where the project is located.

2.07 CLEANER:

In accordance with Base and Tile Manufacturer's recommendations.

2.08 WAX:

Water base in accordance with Base and Tile Manufacturer's recommendations.

2.09 CRACK FILLER:

Water base in accordance with Base and Tile Manufacturer's recommendations.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION OF CONCRETE SUB-FLOOR:

- A. Broom clean, free of all foreign matter.
- B. Fill all cracks, joints etc. with Crack Filler.
- C. Check sub-floor variation with long straight edge. Report excessive variations in sub-floor to Architect.
- D. Moisture Bond Test (Mat Moisture and Bond Test): Verify for acceptability by Tile Manufacturer.
 - 1. Apply specified adhesive on several 3 x 3 foot areas, at fifty (50) foot intervals.
 - 2. Let Adhesive set for 72 hours.
 - a. If the specified adhesive is securely bonded to the substrate after 72 hours, then the substrate is considered sufficiently dry and clean to install the flooring material.
 - 1) Securely Bonded means that an unusual amount of force would be required to lift a panel and that the adhesive would cling to both the slab and the flooring material.
 - 3. Repeat moisture test at 24 hour intervals (up to two 24 hour periods) until specified adhesive becomes well bonded to sub-floor, then proceed with flooring installation. Should the test fail, notify the Architect for direction.
 - 4. On porous or dusty sub-floors, apply prime coat of specified adhesive over entire sub-floor surface.
 - 5. Installation of Tile shall constitute acceptance of sub-floor.

3.02 INSTALLATION OF TILE:

- A. Apply Adhesive in accordance with manufacturer's current specifications.
- B. Install Resilient Tile in accordance with manufacturer's current specifications.
- C. Start installation at center line of room unless indicated otherwise and work towards the borders.
- D. Border Tile shall be not less than half tile.
- E. Installation shall be true, level and even with tight joints.
- F. Fit to and around all permanent fixtures. Fit shall be uniformly tight.
- G. Check Work carefully to see that all Tile are lying down and setting in.

3.03 INSTALLATION OF BASE AND TRANSITIONAL MOULDINGS:

- A. Install Rubber Base and vinyl transitional mouldings in accordance with Manufacturer's current specifications.
- B. Install cove base at Resilient Tile areas as indicated by the Documents.
- C. Install vinyl transitional mouldings at joints between flooring materials.

3.04 CLEANING:

- A. In accordance with Section 01-700, Project Closeout.
- B. Wash floor with Cleaner in accordance with Manufacturer's instructions after Adhesive has set for 5 days minimum.
- C. Rinse with clear water.
- D. Apply 2 coats of Wax in accordance with manufacturer's instructions after Adhesive has set for 14 days minimum.
- E. Buff with electric buffing machine.

3.05 PROTECTION:

- A. There shall be no traffic allowed over floor until Adhesive has properly set.
- B. At all traffic patterns protect floor with un-dyed, untreated building paper.

END OF SECTION

RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Resilient Sheet Athletic Flooring, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

03-300	CAST-IN-PLACE CONCRETE
06-200	FINISH CARPENTRY
06-412	MODULAR CABINETWORK
10-050	MISCELLANEOUS SPECIALTIES

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS, and the following:

AQMCD Air Quality Management Control District, in the location where the Project is located.

1.04 QUALITY ASSURANCE:

- A. Installer Qualifications:
Only skilled and with 5 years minimum experienced resilient sheet athletic flooring installers shall be used for sub-floor preparation and material installation; manufacturer approved.
- B. Manufacturer's Recommendations:
When accepted by the Architect, manufacturer's recommended methods of installation shall be the basis for acceptance or rejection of actual installation methods used.
- C. Provide certification of testing per ASTM F2772-11 indicating the product being furnished complies with all the requirements of ASTM Indoor Sport Floor Classification, including CLASS 3 shock absorption.

1.05 SUBMITTALS:

- A. Materials List: Before any resilient flooring materials are delivered to job site, submit to the Architect in accordance with Section 01-300 Submittals a complete list of all materials prepared to be furnished and installed.
 - 1. Certification by floor covering installer that products supplied for installation comply with local AQMCD regulations controlling use of volatile organic compounds (VOC's).
- B. Color Samples: Submit to the Architect in accordance with Section 01-300 Submittals one complete set of manufacturer's full range of colors (min. of 10) including wood for patterns specified.
- C. Manufacturer's Installation Recommendations: Submit to the Architect in accordance with Section 01-300 Submittals 3 sets of installation method recommendations.

- D. Shop Drawings: Showing installation details and locations of borders, patterns, game lines, location of floor inserts and seams.
- E. Manufacturer Warranty Period: 15 years from date of Substantial Completion.
- F. Installer Warranty Period: 2 years from date of Substantial Completion.

1.06 **PRODUCT HANDLING:**

- A. Delivery:
 - 1. Deliver products to job site in manufacturer's original unopened bundles and containers with legible labels indicating manufacturer's name, pattern and color.
- B. Protection:
 - 1. Use all means necessary to protect resilient sheet athletic flooring materials before, during, and after installation and to protect the installed work and materials of other trades.

1.07 **ENVIRONMENTAL REQUIREMENTS:**

- A. Minimum Temperature Control Requirements: Maintain a constant temperature between 65 & 85 degrees Fahrenheit for 48 hours prior to installation, during installation and for 48 hours after installation. A minimum temperature of min. 65 degrees Fahrenheit shall be maintained thereafter.

PART 2 - PRODUCTS

2.01 **RESILIENT SHEET ATHLETIC FLOORING:**

- A. General: All resilient sheet athletic flooring shall be the product of one manufacturer and shall to maximum extent possible be of a single batch number.
- B. Acceptable Product: All resilient sheet flooring shall be manufactured by GERFLOR USA, or approved equivalent.
 - 1. Gerflor Taraflex Sport M Plus DRY-TEX Sports Flooring installed with Gerpur high-moisture tolerance full-spread adhesive.
 - 2. Product Description: Dual-durometer foam-backed sheet vinyl flooring designed for fully adhered athletic flooring applications.
 - 3. ASTM E648, Class 1 Flame / smoke rated.

2.02 **ACCESSORIES:**

- A. All other materials, including adhesives, underlayments, patching compounds, and cove support base not specifically described but required for complete and proper installation of resilient sheet athletic flooring shall be only as recommended by manufacturer, in compliance with AQMCD requirements and shall be subject to approval of the Architect.
- B. Metal Edge Strip 4" high of extruded aluminum with mill finish required to protect exposed edge of flooring, and in maximum available lengths to minimize running joints.
- C. Game-Line and Marker Paint: Complete system including primer, compatible with flooring and recommended by flooring and paint manufacturers.

2.03 ADHESIVE:

- A. Adhesive as recommended by manufacturer, in accordance with AQMCD requirements in the place where the project is located.
 - 1. Seam Sealer matching color formulation provided or approved by floor covering manufacturer for products indicated.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS:

- A. Inspection:
 - 1. Prior to all work of this Section, carefully inspect the installed work of all other related trades and verify that all such work is complete and acceptable for proper commencement of installation of resilient sheet athletic flooring.
 - 2. Verify that resilient sheet athletic flooring may be installed in accordance with approved manufacturer's installation recommendations, including the Moisture and slab surface deviation Test.
- B. Discrepancies:
 - 1. Report discrepancies or variations in subfloor immediately to the Architect.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been resolved. Installation of resilient sheet flooring shall constitute acceptance of sub-floor.

3.02 PREPARATION:

- A. Subfloor shall be prepared in accordance with approved manufacturer's installation recommendations. Subfloor should be clean and dry, all cracks, joints and voids shall be filled in an approved manner and surface primed as required in order to comply with approved installation recommendations.
- B. Moisture Testing: Perform ASTM F 2170 relative humidity test and proceed with installation only after substrates have relative humidity levels below the maximum allowed.
- C. Use Gerflor's GerPatch trowelable concrete based patching compound with the same moisture vapor tolerance as the adhesive to fill depressions, holes, cracks, grooves or other irregularities in substrate.
- D. Sand the surface of the concrete slab.
- E. Sweep and then vacuum substrates immediately before installation. After cleaning, examine substrate for moisture, alkaline salts, grit, dust or other contamination. Proceed with installation only after unsatisfactory conditions have been corrected.

3.03 INSTALLATION:

- A. Install all resilient sheet athletic flooring in strict accordance with the design and approved manufacturer's recommendations.
 - 1. Maintain uniformity of sheet floor covering direction.
 - 2. Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case less than 6 inches away from parallel joints in flooring substrates.
 - 3. Match edges of resilient floor coverings for color shading and pattern at seams; provide shop drawings for seam locations.

4. Avoid cross seams.
 5. Scribe, cut and fit resilient sheet flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including cabinets, pipes, outlets, edgings, thresholds and nosings.
 6. Extend resilient sheet flooring into toe spaces, door reveals, closets and similar openings.
 7. Maintain reference markers, holes or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.
- B. Manufacturer's recommended adhesive shall be applied around perimeter, at seams, and around all fixtures to provide a homogeneous surface.
1. Bond seams in resilient sheet athletic flooring. Prepare seams and apply seam sealers to produce tightly fitted seams without gaps or overlaps.
 2. Hand roll resilient sheet flooring in both directions from center out to embed floor coverings in adhesive and eliminate trapped air. At walls, door casings, and other locations where access by roller is impracticable, press floor coverings firmly in place with flat-bladed instrument.
- C. Game Lines and Logos:
1. Lay out game lines and logos to comply with rules and diagrams published by National Federation of State High School Association for the sports activities indicated.
 4. Mask flooring at game lines and logos, and apply paint of color indicated to produce clean, sharp and distinct edges.

3.04 CLEANING & PROTECTION:

- A. Perform the following operations after completing resilient athletic flooring installation:
1. Remove marks and blemishes from flooring surfaces.
 2. Sweep and then vacuum flooring.
 3. Damp-mop flooring to remove soiling.
 4. No traffic shall be allowed over flooring until adhesive has set.
 5. At all traffic patterns and as required during execution of work by others, protect flooring with undyed, untreated building paper.

3.05 PRODUCT DATA INFORMATION:

- A. Resilient sheet athletic flooring material shall be supplied from the same batch number for each color to be installed.

“Taraflex Sport M Plus” by GERFLOR USA, color and pattern as selected by Architect from manufacturer’s resilient sheet flooring products, or approved equivalent.

WEARING SURFACE.....Smooth
OVERALL THICKNESS.....0.3 inch (nominal)
WEARING LAYER THICKNESS.....0.080 inch (nominal)
STATIC LOAD LIMIT.....100 psi
TYPE (In accordance with ASTM F 1303).....II
GRADE (In accordance with ASTM F 1303).....A
BACKING.....high density, dual-durometer close cell foam
SHEET WIDTH.....6 feet wide (nominal)
SEAMING METHOD.....Heat Welded
PERFORMANCE CHARACTERISTICS:

CRF.....CRF 0.45 W/cm2 or greater rating in accordance with ASTM E 648.
SMOKE DENSITY...NBS Smoke Density Chamber (ASTM E 662), less than 450
FLAME SPREAD.....75 or less in accordance with ASTM E 84

ATHLETIC PERFORMANCE PROPERTIES:

- A. Comply with ASTM F 2772-11 Performance Level CLASS 3 for force reduction, ball bounce, vertical deformation and surface friction.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This section specifies epoxy floor coating (EPXY) for floors and wall bases.

1.02 SUBMITTALS:

- A. Comply with pertinent provisions of Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's technical data and application instructions.
- C. Samples: Prior to beginning work submit 3 samples for review of color and texture.

1.03 QUALITY ASSURANCE:

- A. Applicator Qualifications: Engage an experienced applicator trained and approved by the manufacturer.
- B. Warranty: Manufacturer shall furnish a single, written warranty covering both materials and workmanship for a period of three full years from date of project completion.

1.04 PROJECT CONDITIONS:

- A. Application Temperature: Do not apply material when wither the substrate or the material is outside the temperature limits required by the manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURER:

- A. Subject to compliance with requirements, provide products of the following, or approved equal:
 - 1. Sherman Williams, Decorative Broadcast

2.02 MATERIALS:

- A. System:
 - 1. Kitchen: Ceramic Carpet #400.
 - 2. Janitor: Ceramic Carpet #400
- B. Color: As selected by Architect.

2.03 PERFORMANCE REQUIREMENTS:

A. Performance Properties – Ceramic Carpet #400, Decorative Broadcast:

CHARACTERISTIC	PERFORMANCE	TEST METHODS
Compression	7,700 psi	ASTM C-579
Tensile Strength	1,000 psi	ASTM C-307
Flexural Strength	2,400 psi	ASTM C-580
Hardness	80-84	ASTM D2240
Bond Strength	>400 (100%) (Concrete failure)	ASTM D-4541
Abrasion Resistance	0.05 grams	ASTM D4060
Flammability (UT only)	Self Extinguishing	ASTM D-635
Thermal Coefficient of Linear Expansion	1.1 x 10 ⁻⁵ in.	ASTM E-831
Water Absorption	0.056%	ASTM C-413
Heat Resistance	200° F continuous 250° F intermittent	

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Prepare concrete by mechanical means including use of scabber, scarifier or shot blast machine for surface removal.
- B. All surfaces shall be surface dry and free of dirt, dust, grease, oil, wax, paints, or other foreign material which could cause loss of adhesion.

3.02 APPLICATION:

- A. Surface Priming: Prime all properly prepared substrates using appropriate manufacturer's penetrating primers with strict adherence to installation instructions.
- B. Install epoxy floor coatings following manufacturer's written instructions and directions.
- C. Where epoxy floor coatings occur under kitchen equipment, provide a smooth finish. All other areas exposed to foot traffic, provide slip-resistant finish.
- D. Chasing: All areas where the installed coating does not abut against a vertical surface shall be chased. Cut chase 1-1/2-inch wide chiseled to a straight saw-cut 1/2 -inch depth.
- E. Cove Bases: Where scheduled, install cove integral with the floor in height indicated & 1/2" minimum radius cove. All coves with manufacturer's specially design cove strip; provide continuous metal edge trim at top of base.

- F. Expansion and Control Joints: Where indicated saw-cut joints after floor installation and fill with manufacturer's flexible epoxy or urethane sealant. Flooring joint locations to match joints in concrete.

3.03 CLEANING:

- A. Clean-up: At the end of each workday, remove rubbish, empty cans, rags and other discarded materials from the site.

3.04 PROTECTION:

- A. Protect work of other trades against damage from coating application. Correct damage by cleaning, repairing, and replacing, as acceptable to the Architect. Leave in an undamaged condition.
- B. Protect newly-applied coating with 2-layers of non-staining protection paper taped in place with duct tape. Tape first layer of Fortifiber Corp. "Seekure" floor protection sheet or similar heavy duty kraft paper. Tape a second layer of regular kraft paper over first layer. Tape all seams.

END OF SECTION

PAINTING

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Painting, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

- A. Material and Equipment to be Painted: Paint all piping, unwrapped ductwork, electric conduits where exposed to view or located in mechanical rooms or mechanical buildings. Paint all factory primed machinery or equipment. Prime and paint all exposed factory finished mechanical and electrical equipment and accessories which are exposed to the exterior and/or interior of buildings except as specifically excluded.
- B. Material and Equipment not to be Painted: Do not paint piping, ductwork, equipment and machinery located in attic spaces, above furred or suspended ceilings, in furred pipe or duct spaces. Do not paint factory finished equipment or machinery located in mechanical rooms or mechanical buildings, attics, furred or suspended ceilings (unless specifically scheduled).

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
05-100	STRUCTURAL METAL AND METAL FABRICATIONS (Shop Priming)
07-600	FLASHING AND SHEET METAL (Shop Priming)
08-100	METAL DOORS AND FRAMES
08-700	FINISH HARDWARE
08-800	GLASS AND GLAZING
DIV. 15	MECHANICAL
DIV. 16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

CARB	California Air Resources Board - Materials and equipment used for this Project shall comply with Air Quality Control Standards in effect at the Project Site, and at the time of installation.
LAUSD	Los Angeles Unified School District (Approved Material List) Copies of this standard are available at the cost of reproduction of the Owner's Office by calling (209) 441-3081.
CAL/OSHA	California/Occupational Safety and Health Act.
PDCA	Painting and Decorating Contractors of America, latest edition of the Architectural Specification Manual, as prepared by Specification Services, Inc., Washington State Council of the PDCA.

1.04 QUALITY ASSURANCE:

- A. Flame Spread Ratings:
 - 1. Paint finishes in required exit stairways, corridors and exitways must meet flame spread ratings as required by regulatory agencies.
 - 2. Class 1 - Tunnel Test 0-25 for enclosed required exit stairways.
 - 3. No interior paint or wall finish permitted having a tunnel test in excess of 200. All paint materials must be certified that materials meet these requirements.

- B. Compatibility:
 - 1. Paint materials and equipment shall be compatible in use.
 - 2. Finish coats shall be compatible with prime coat.
 - 3. Prime coats shall be compatible with surface to be coated.
 - 4. Tools and materials shall be compatible with coating to be applied.

- C. Air Quality:
 - 1. Paint materials and equipment used for application will comply with CARB Air Quality Control Standards in effect at the Project Site and at the time of application.

1.05 SUBMITTALS:

- A. Product Data: In accordance with Section 01-300 Product Submittals, submit complete material list and color samples.

- B. Materials Lists:
Format in accordance with Article 09-900/3.05 Paint Finish Schedule.

- C. Colors: In accordance with Section 01-300.
Selected colors and finishes:
 - 1. Size: 8-1/2" x 11" boards.
 - 2. Quantity: 3 boards of each color and finish.
 - 3. Board material wherever possible and for transparent finishes shall be same as material to be finished. Opaque finishes may be on heavy card stock.

- D. Maintenance Material:
 - 1. Quantity: 10% of quantity needed to paint Project, but not to exceed one gallon, of each type and color of finish coat used.
 - 2. Identification: Indicate location(s) of finish.

1.06 PRODUCT HANDLING:

- A. Delivery:
 - 1. In manufacturer's original sealed containers with labels and other markings intact.

- B. Storage:
 - 1. Store materials and equipment in well vented area. All receiving opening and mixing shall be done in this area. Area shall be kept neat, clean and locked. Oily rags and waste shall be removed from area each night and all other precautions shall be taken to avoid danger of fire.
 - 2. Empty containers shall not be removed from site without Architect's approval.

- C. Handling:
 - 1. Mixing and Tinting: Do no tinting finish coats at job site, unless otherwise approved by Architect. Do not reduce or change except as directed by Architect. All pigmented colors shall be factory tinted.

1.07 JOB CONDITIONS:

- A. Existing Conditions:
 - 1. Examine all surfaces to be painted to determine job conditions and the degree of surface preparation necessary.
- B. Environmental Requirements:
 - 1. Surfaces shall be painted only when they are free from moisture. No painting of exterior surfaces shall be done less than 72 hours of actual drying weather after a rain nor during periods of dew or fog.
 - 2. No painting shall be done when temperature is below 50 degrees F.
 - 3. No exterior painting shall be done during winds or dusty conditions.
- C. Protection:
 - 1. Protect all adjacent surfaces from drips, spray and other damage from work under this Section.
 - 2. Protect freshly painted surfaces from dust and other foreign material until finish is fully dry.

1.08 WARRANTIES:

- A. In accordance with Section 01-740 WARRANTIES.
- B. Original adherence of all materials and no evidence of any surface defect shall be maintained during warranty period.
- C. Color at end of warranty period shall remain free from serious fading and any discernable variations shall be uniform.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Paint reference number indicated in Article 09-900, Part 3, Paint Finish Schedule refer to:

SHERWIN WILLIAMS

- B. Paint material quality and systems shall be equal to numbers and systems listed in Article 09-900/3.05, Paint Finish Schedule.
- C. Other acceptable manufacturers are (as listed in the LAUSD Approved Materials List) BAUER, CAL-WESTERN, CENTURY, DECRATREND, DUNN EDWARDS, EPMAR COATINGS, FRAZEE, FULLER-0'BRIEN, KWAL-HOWELL, PACIFIC, SHERWIN WILLIAMS, VESTAL, and VISTA. Submittals by these manufacturers, subject to specification requirements, must be in accordance with Section 01-300, SUBMITTALS.
 - 1. Review of manufacturer's submittals will be checked against the latest Paint Equivalency List as provided by DUNN EDWARDS. Paint numbers submitted that differ from that listed on the DUNN EDWARDS list must be accompanied by an explanation of the difference and a certification from the installer that the different paint number is equal to or better than that specified.
 - 2. Other manufacturers not listed shall submit in accordance with Section 01-640, SUBSTITUTIONS.
- D. Where possible, paint materials shall be product of only one manufacturer.

2.02 COLORS:

- A. Determined by Architect prior to or as work progresses. Colors to be selected from paint manufacturer's full color systems such as SHERWIN WILLIAMS interior and exterior paint and stain selection system.
- B. When deep or ultra colors are selected, system number are to be revised according to manufacturer's recommendations for flat and semi-gloss finishes.
 - 1. Gloss standards (based on a 60 degree gloss meter) are as follows:

Full Gloss	70 degrees and higher
Semi-Gloss.....	48 to 70 degrees
Egg Shell.....	30 to 48 degrees
Lo-Sheen.....	15 to 30 degrees
Satin.....	30 degrees and below
- C. When deep or ultra colors are selected for use on walls or special color treatments such as graphics or many color changes are desired, the areas and extent of use will be clarified upon request of the Contractor.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Prior to application of paint, inspect the installed Work executed under other Sections which affects the application of paint.
 - 1. The Installer is responsible for verifying the compatibility of items primed by others and the finish coat or coats required by the Contract Documents. Should an incompatibility occur, the Installer (along with the major paint company's technical representative) will recommend compatible alternatives for the Architects review and acceptance.
- B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been corrected.
- C. Application of Paint shall constitute acceptance of existing condition.

3.02 SURFACE PREPARATION:

- A. General:
 - 1. In accordance with PDCA Standards.
 - 2. Surfaces to be finished shall be clean, dry and free of dirt, oils, loose paint and any other contamination that would adversely affect adhesion, protective properties or appearance of the coating.
 - 3. All oil, grease, dirt or other foreign matter shall be removed by washing with a solution of cleaner and water, rinse and allow to dry.
 - 4. If efflorescence, alkali or glazed surfaces exist, neutralize with acid wash followed by thorough water rinsing.

- B. Wood: In accordance with PDCA Chapter 3 or Chapter 3R.
 - 1. Fill holes and other imperfections with putty or plastic wood to match natural finish after application of prime or seal coat.
 - 2. Provide necessary extra treatment over knots, pitch pockets, sappy portions and other defects to produce a proper base for painting.
 - 3. Sand down raised grain or rough surfaces.
 - 4. Clean surfaces free of dust, soil and other foreign material.

- C. Drywall: In accordance with PDCA Chapter 3 or Chapter 3R.
 - 1. Clean surfaces of dirt, laitance, excess mortar and foreign matter.
 - 2. Do all necessary minor sanding.
 - 3. Fill minor cracks, scratches, holes and nail heads.

- D. Plaster and Concrete: In accordance with PDCA Chapter 3 or Chapter 3R.
 - 1. Clean surfaces of dirt, laitance, excess mortar and foreign matter.
 - 2. Neatly patch, flush and smooth, minor cracks, holes, pits and other imperfections in plaster or concrete surfaces.

- E. Metals: In accordance with PDCA Chapter 3 or Chapter 3R.
 - 1. Shop Primed: Remove dust, oil and rust. Touch up imperfections, scratches, surface damage, etc. with primer. Field connection welds, soldered joints, burned and abraded portions shall be spot primed.
 - 2. Shop Primed or Factory Primed Flashing or Manufactured Items (Coil-coated products): Remove dust, oil and rust. Touch up imperfections, scratches, surface damage, etc. with primer. Field connection welds, burned and abraded portions shall be spot primed. Field apply manufacturer's recommended primer coat over entire surface compatible with substrate finish and finish coats indicated on the paint schedule.
 - 3. Unprimed: Remove dust, rust, mill scale, grease and foreign matter by sand blasting or wire brushing. Surfaces to be smooth and ready to receive painting.
 - 4. Galvanized: Clean with commercial pretreatment solutions as required by manufacturer's instruction of paint used. Prime at exterior installations.

- F. Concrete Block: In accordance with PDCA Chapter 3 or Chapter 3R.
 - 1. Clean and free of all dirt, dust, rust, oil and free from all foreign matter.
 - 2. Test for moisture content. Do not paint if moisture is present. Concrete Blocks to be thoroughly dry and cured prior to painting.

3. Do not paint Masonry wall if joints are not properly pointed, has excessive mortar drippings cracked units or shows signs of excessive efflorescence. Notify Architect promptly through General Contractor. Do not paint until unsatisfactory and unacceptable Concrete Block surfaces are corrected suitable for painting.
4. Do not apply opaque finishes to Concrete Block with airless sprayer unless “backrolled”.

3.03 APPLICATION:

- A. Standards:
 1. In accordance with PDCA Standards.
 2. In accordance with manufacturer’s specifications.
- B. Method:
 1. Apply by brush, roller or spray in accordance with paint manufacturer’s recommendations except where specified otherwise in Schedule of Paint Finishes.
 2. Doors are not to be painted by roller.
- C. Paint:
 1. All coatings shall be applied without reduction except as specifically required by label directions, or required to be reduced by this Specification. In such cases, reduction shall be the minimum permitted.
 2. Apply each coat evenly and allow to dry prior to applying succeeding coats. Each coat to have enough consistency to conceal work to which is applied.
 3. Cut into a true line and leave smooth and clean without overlapping. Paint doors and windows in open position.
 4. Sand finishes on smooth surfaces so as to assure proper adhesion of subsequent coats.
 5. Tint each coat a different lighter tint from preceding coat to the approved finish color.
 6. Apply paint system so as to obtain not less than the dry mil thickness recommended by the manufacturer.
 7. Sand metal work only as necessary to provide for complete bonding of coats.
 8. Inspector or Architect to inspect and approve each coat and operation before succeeding coats are applied.
 9. Finish work to be free from runs, sags, defective application and improper workmanship.
 10. Back prime all woodwork and casework coming in contact with plaster, masonry or concrete immediately upon delivery to project.
 11. Post sign promptly following application of paint.

3.04 CLEANING:

- A. In accordance with the provisions of the General Conditions and the applicable Division 1 requirements.
- B. Remove all misplaced paint, stain, spots and spills.
- C. Provide necessary drop cloths and cover finished work adjacent to work in process.
- D. Protect and safeguard work of other trades.

3.05 PAINT FINISHES SCHEDULE:

- A. Refer to Exterior and Interior Paint Schedule on Drawings for applicable finishes used. This is a guide only and paint sub-contractor is responsible to check all drawings and be responsible for all paint work required to cover the complete painting and finishing of the interior and exterior including specialty items.
- B. It is the intent of the specifications and drawings to cover the complete painting and finishing of the interior and exterior or all the buildings whether or not it is specifically called for in the Specifications, Schedule of Paint Finishes, or indicated on the Drawings. Paint reference numbers indicated in the following Paint Finishes Schedule refer to "SHERWIN WILLIAMS" Paint reference numbers. Surfaces not specified in Paint Finishes Schedule shall be in accordance with manufacturer's recommendations.

C. INTERIOR PAINT FINISHES:

1. **WOODWORK (Interior)**

W-1 Flat Vinyl Acrylic

1st Coat	Enamel Undercoat	B51W00620 Pro Block Primer
2nd Coat	Finish	B30W02651 Pro Mar Latex Flat
3rd Coat	Finish	B30W02651 Pro Mar Latex Flat

W-2 Semigloss Acrylic Non-Blocking Enamel

1st Coat	Enamel Undercoat	B51W00620 Pro Block Primer
2nd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss
3rd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss

W-3 Gloss Acrylic Non-Blocking Enamel

1st Coat	Enamel Undercoat	B51W00620 Pro Block Primer
2nd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss
3rd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss

2. **DRYWALL (Interior)**

DW-1 Flat Vinyl Acrylic

1st Coat	Sealer	B28W0800 PVA Primer Sealer
2nd Coat	Finish	B30W02651 ProMar Latex Flat
3rd Coat	Finish	B30W02651 ProMar Latex Flat

DW-2 Semigloss Enamel

1st Coat	Sealer	B28W0800 PVA Primer Sealer
2nd Coat	Finish	B31W02651 ProMar Latex Semi-Gloss
3rd Coat	Finish	B31W02651 ProMar Latex Semi-Gloss

3. CEMENT PLASTER AND GYPSUM PLASTER (Interior)

P-1 Flat Vinyl Acrylic

1st Coat	Acrylic Sealer	B51W00620 Pro Block Primer Sealer
2nd Coat	Finish	B30W02651 ProMar Latex Flat
3rd Coat	Finish	B30W02651 ProMar Latex Flat

P-2 Semigloss Vinyl Acrylic Enamel

1 st Coat	Acrylic Sealer	B51W00620 Pro Block Primer Sealer
2nd Coat	Finish	B31W02651 ProMar Latex Semi-Gloss
3rd Coat	Finish	B31W02651 ProMar Latex Semi-Gloss

P-3 Semigloss Polyester-Epoxy

1st Coat	Sealer	B51W00620 Pro Block Primer Sealer
2nd Coat	Finish	B73W00111 Tile Clad Epoxy
3rd Coat	Finish	B73W00111 Tile Clad Epoxy

4. CONCRETE AND CONCRETE BLOCK (Interior)

CB-1 Clear Sealer

(Follow manufacturer's recommended coverage rate for type of substrate to be covered)

One Coat	Sealer	B01403187 Aqua Treat Concrete
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CB-2 Flat Vinyl Acrylic - Fine Texture

1st Coat	Vinyl Block Primer	B42W00046 H.D. Block Filler
2nd Coat	Finish	B30W02651 ProMar Latex Flat
3rd Coat	Finish	B30W02651 ProMar Latex Flat

CB-3 Semigloss Vinyl Acrylic Enamel

1st Coat	Vinyl Block Primer	B42W00046 H.D. Block Filler
2nd Coat	Finish	B31W02651 ProMar Latex Semi-Gloss
3rd Coat	Finish	B31W02651 ProMar Latex Semi-Gloss

CB-4 High Clear Gloss Polyamid Epoxy

1st Coat	Vinyl Block Primer	B42W00046 H.D. Block Filler
2nd Coat	Finish	B73W00111 Tile Clad Epoxy
3rd Coat	Finish	B73W00111 Tile Clad Epoxy

5. METALS (Interior)

PRIMER NOTE: Metal not shop primed shall be primed with appropriate primer:

Ferrous Metal	Primer per manufacturer
Galvanized Metal	Primer per manufacturer
Aluminum	Primer per manufacturer

COIL-COATED PRODUCTS NOTE: Metal products primed with coil-coated products are to be assumed to be unprimed products and shall be re-primed as follows.

Coil-Coated Products	Field apply manufacturer's recommended primer coat and mil thickness over entire surface compatible with substrate finish and finish coats indicated on paint schedule.
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M-1 Flat Vinyl Acrylic

1st Coat	Primer	See primer note above
2nd Coat	Finish	B30W02651 ProMar Latex Flat
3rd Coat	Finish	B30W02651 ProMar Latex Flat

M-2 Semigloss Industrial Alkyd “Ultra Color See 3.05 E.1.”

1st Coat	Primer	See primer note above
2nd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss
3rd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss

M-3 Gloss Acrylic “Ultra-Color See 3.05 E.1.”

1st Coat	Primer	See Primer note above
2nd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss
3rd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss

M-4 Gloss Polyamid Epoxy

1st Coat	Primer	See Primer note above
2nd Coat	Finish	B73W00111 Tile Clad Epoxy
3rd Coat	Finish	B73W00111 Tile Clad Epoxy

6. ACOUSTICAL TILE (Interior)

A-1 Flat Polyvinyl Acetate

1st Coat	Finish	B30W07700 ProMar 700 Latex Flat
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D. EXTERIOR PAINT FINISHES

1. CONCRETE AND CONCRETE BLOCK (Exterior)

ECB-1 Clear Sealer

(Follow manufacturer’s recommended coverage rate for each coat and type of substrate to be covered)

1st Coat	Sealer	B01403187 Aqua Treat Concrete
2nd Coat	Sealer	B01403187 Aqua Treat Concrete

ECB-2 Flat 100% Acrylic

1st Coat	Vinyl Block Primer	B42W00046 H.D. Block Filler
2nd Coat	Finish	A06W00151-A100 Latex Flat
3rd Coat	Finish	A06W00151-A100 Latex Flat

2. CEMENT PLASTER (Exterior)

EP-1 Flat 100% Acrylic

1st Coat	Finish	A24W08300 LOXON Primer
2nd Coat	Finish	A06W00151-A100 Latex Flat

EP-2 Semigloss Polyester-Epoxy

1st Coat	Sealer	A24W08300 LOXON Primer
2nd Coat	Finish	B73W00111 Tile Clad Epoxy

EP-3 Elastomeric Coating System

1st. Coat	Sealer	A24W08300 LOXON Primer
2nd. Coat	Finish	A05W00651 Sher Lastic Elastomeric
3rd. Coat	Finish	A05W00651 Sher Lastic Elastomeric

Note : Each coat shall be 7.0 Mils. & 2nd. Coat to be back rolled.

3. METAL (Exterior)

PRIMER NOTE: Metal not shop primed shall be primed with appropriate primer:

Ferrous Metal	Primer per manufacturer
Galvanized Metal	Primer per manufacturer
Aluminum	Primer per manufacturer

COIL-COATED PRODUCTS NOTE: Metal products primed with coil-coated products are to be assumed to be unprimed products and shall be re-primed as follows:

Coil-Coated Products Field apply manufacturer’s recommended primer coat and mil thickness over entire surface compatible with substrate finish and finish coats indicated on paint schedule.

EM-1 Flat 100% Acrylic

1st Coat	Primer	See primer note above
2nd Coat	Finish	A06W00151-A100 Latex Flat
3rd Coat	Finish	A06W00151-A100 Latex Flat

EM-2 Semigloss Alkyd Synthetic “Ultra-Color See 3.05 E.1.”

1st Coat	Primer	See primer note above
2nd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss
3rd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss

EM-3 Gloss Alkyd “Ultra-Color See 3.05 E.1.”

1st Coat	Primer	See primer note above
2nd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss
3rd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss

EM-4 Gloss Alkyd “Ultra-Color See 3.05 E.1”, Spray Applied, Deep Tone,

1st Coat	Acid Etch	Vinyl Wash Primer
2nd Coat	Primer	See primer note above
3rd Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss
4th Coat	Finish	A77W00051 SOLO 100% Acrylic Gloss

EM-5 Gloss Polyurethane Finish “Ultra Color See 3.05 E.1”, Spray Applied, Deep

1st Coat	Primer	25 P by DuPONT
2nd Coat	Finish	B65WJ0311 Hi-Solids Polyurethane Gloss CA
3rd Coat	Finish	B65WJ0311 Hi-Solids Polyurethane Gloss CA

4. WOOD (Exterior)

EW-1 Flat 100% Acrylic

1st Coat	Primer	B51W00620 Pro Block Later Primer
2nd Coat	Finish	A06W00151-A100 Latex Flat
3rd Coat	Finish	A06W00151-A100 Latex Flat

EW-2 Semigloss 100% Acrylic

1st Coat	Primer	B51W00620 Pro Block Latex Primer
2nd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss
3rd Coat	Finish	A76W00051 SOLO 100% Acrylic Semi-Gloss

E. SPECIALTY PAINT FINISHES:

GENERAL NOTES:

1. A fourth and/or fifth coat may be required to achieve uniform chromatic hue selected without undercoat or substrate ghosting; especially on deep tone colors, or over dark primers.

Finish No. X-1 Lines on Concrete or Asphaltic Concrete Paving

1st Coat	Traffic Paint	Set Fast Traffic Paint
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Finish No. X-2 Lines on Walk Top

1st Coat	Line Paint	Set Fast Traffic Paint
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Finish No. X-3 Space above Vents or Grilles

1st Coat	Flat Black	Vinyl Acrylic
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Finish No. X-4 Piping Black Steel or Cast Iron.

1st Coat	Red Oxide Primer	Primer
2nd Coat	Machinery Enamel Finish	Gloss Enamel

Finish No. X-5 Piping Galvanized

1st Coat	Chromate Primer	Primer
2nd Coat	Machinery Enamel Finish	Gloss Enamel

Finish No. X-6 Machinery and Equipment (Coil Coated Products)....

1st Coat	See primer note above	As recommended by manufacturer
2nd Coat	Machinery Enamel Finish	Gloss Enamel
3rd Coat	Machinery Enamel Finish	Gloss Enamel

Finish No. X-7 Sheet Metal Ducts

1st Coat	Primer	Primer
2nd Coat	Machinery Enamel Finish	B35 Gloss Enamel

Finish No. X-8 Fire Hydrants

1st Coat	Alkyd Metal Primer	Primer
2nd Coat	Machinery Enamel Finish	B35 Gloss Enamel

Finish No. X-9Same as EM-1
Following items listed will receive Finish No. X-9 (this is not intended to be a complete list but only a guide).

1. Louvers
2. Grilles
3. Access Panels

Finish No. X-10 Stripping under Acoustical Board Surrounding:

1st Coat	Flat Black	B30-600 PVA Sealer
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Finish No. X-11 Acoustical Board

1st Coat	Flat Black	B75 SWB Vinyl Acrylic
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Finish No. X-12 Decorative, Intumescent Fire Retardant Paint

NOTE: Minimum thickness shall be determined by the manufacturer in accordance with the fire ratings required for the steel to be protected. See the drawings for fire ratings.

1st Coat	Intumescent coating	Ad Firefilm by FIPRO
2nd Coat	Decorative Finish Coat	As approved by FIPRO compatible with intumescent paint.

END OF SECTION

MISCELLANEOUS SPECIALTIES

PART 1 - GENERAL

1.01 SCOPE

Work included in this Section: Provision for and installation of specialty and built-in items required for this work as indicated on the Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
01-018	OWNER FURNISHED ITEMS
03-300	CAST-IN-PLACE CONCRETE
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
06-100	ROUGH CARPENTRY
06-200	FINISH CARPENTRY
06-220	MILLWORK
06-412	MODULAR CABINET WORK
07-600	FLASHING AND SHEET METAL
08-800	GLASS AND GLAZING
09-100	LATH AND PLASTER
09-900	PAINTING
DIV.15	PLUMBING
DIV.16	ELECTRICAL

1.03 STANDARDS:

In accordance with Section 01-080 Codes and Standards.

1.04 QUALITY ASSURANCE:

For actual installation of assemblies, use only personnel who are thoroughly trained and experienced in the required skills and who are completely familiar with the manufacturer's recommended methods of installation.

1.05 SUBMITTALS:

Before any specialty items are delivered to the job site, submit Shop Drawings and catalog cuts to the Architect in accordance with the provisions of SUBMITTALS Section of these Specifications, showing all details of installation and assembly and all requirements for work by other trades, and showing all colors available from the selected manufacturer in the quality specified.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Protection: Use all means necessary to protect all specialty items before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 SEE SCHEDULE ARTICLE 3.04 OF THIS SECTION:

All items shall be as scheduled or approved equivalent items as set forth in the Substitutions Section of these specifications, and all provisions of Division 1, and the General Conditions.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Coordination: Coordinate with all other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected specialties in the locations required.
- B. Inspection:
 - 1. Prior to Installation, inspect all specific locations and verify that all necessary provisions have been made.
 - 2. In the event of discrepancy, immediately notify the Architect.
 - 3. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION:

Install all specialty items where indicated on the Drawings and in full accordance with all pertinent regulations and the manufacturer's recommendations, anchoring all components firmly in place for long life under hard use, and in accordance with CBC Interpretive Regulations.

3.03 INSPECTION AND ADJUSTMENT:

Upon completion of the installation, and as a condition of its acceptance, visually inspect the entire work of this Section, adjust all components for proper alignment and use, and touch up all abrasions and scratches to make them completely invisible.

3.04 SCHEDULE:

1. DETECTABLE WARNING PANELS: TRUNCATED DOMES

Provide and install Detectable Warning Panels (ADA & CBC Compliant DSA-ACS approved per 11B-705.3). Raised Truncated Incline Domes Pattern on Surface Mount Composite Panel System as Manufactured by ADA SOLUTIONS INC. (1-800-327-0519). Homogeneous fiberglass and carbon reinforced composite panels with ADA compliant truncated dome pattern on exposed surfaces, panels are colorfast and UV stable with uniform color throughout the thickness of the panel. Detectable warning surfaces shall differ from adjoining surfaces in resiliency or sound-on-cane contact.

- A. Replaceable Wet-Set Detectable warning Tile Panels: Tile panels design for setting in freshly poured concrete and mechanically anchored with stainless steel fasteners. Tiles are ¼ inch nominal thickness with ¾ inch thick by 1 inch wide perimeter flange.
- B. Surface Mount Detectable Warning Tile Panels: Tile panels designed for surface application on existing concrete with mechanical and adhesive fastening. Tiles are 3/16 inch thick with ½ inch wide beveled edge at all edges.

- C. Dome Size:
Base Diameter: 0.9 -0.92 inch
Top Diameter: 0.45 – 0.47 inch
Dome Height: 0.20 inch
- D. Dome Spacing: Center-to-center spacing of 2.3 – 2.4 inches and base-to-base spacing of 0.65 minimum, measured between the most adjacent domes on a square grid.
- E. Color: Yellow and approximate FS 33538 of Federal Standard 595C.

2. DIMENSIONAL LETTERS:

- Provide and install dimensional letters as manufactured by GEMINI INC.; 1-800-LETTERS or approved equal. Letters shall be 12” & 6” high letters (including punctuation characters) LASER CUT ACRYLIC Series, precision cut from solid 3/4” thick acrylic, with Standard painted finish as selected by Architect.
- Eurostyle Bold Extended type with flush stud mounting. Install per manufacturer installation instructions.

3. HIGH IMPACT RIGID VINYL PANELS:

“ACROUVYN” UL Rated protective wall covering panels in sizes indicated on the drawings.

1. Provide manufacturer’s standard Vinyl/Acrylic extrusions in a nominal wall thickness of 0.40; 4 x 10 sheets.
2. Finish to be manufacturer’s matte finish “suede texture” in color as selected by Architect from manufacturer’s full color range.
3. Material to be Class I, when tested in accordance with ASTM E 84.
4. Provide manufacturer’s recommended adhesive for the substrate material indicated on the drawings, and in accordance with the UL Rating.
5. Provide the manufacturer’s recommended matching trim pieces and fabricated configurations.

4. DRAPERY & TRACK SYSTEM:

A. Furnish and install 200 Series Black Medium-Duty Straight Track Manual System bi-parting truss traveler track complete with all necessary components by H & H INCORPORATED or approved equivalent. Track shall be mounted as indicated on the drawings. Entire system shall carry a two year warranty, provided by Decorator Draperies, Fresno, California, (559) 299-4544.

B. DRAPERY:

Curtain fabric shall be woven 100% cotton Velour, 25oz. per linear yard. 54 inches wide, flame retardant to meet and pass NFPA 701 small scale: as supplied by Decorator Draperies (559) 299-4544. All curtains shall bear manufacturer’s label indicating required flame resistance. Color to be selected by Architect from manufacturer’s standard colors.

Fabrication of Stage Draperies:

All fabrics shall be without flaws, and from the same dye lot. Each fabric panel shall be continuous for full height of the curtain, with no horizontal seams. Fabricate vertical seams with material fed straight to machine, equally lapped and stretched, and finished free of sag, wrinkles or puckers, using threads of matching color. Salvage edges shall be properly clipped and curtains shall finish square and true. Cross seams are not acceptable. Draw curtains shall be fabricated in 2 equal sections, and each half shall be one foot greater in length than the area to be covered to allow for center overlap. Fabric shall be sewn at top of drape shirred at the rate of 50% added fullness to a continuous length of 3 ½ inch wide jute webbing with three rows of stitches. With a minimum of one inch of face fabric turned back. Insert snaps at 12

inches apart, except at leaders where they shall be spaced to match track leader component. Bottom hem shall be 6 inches wide, lined with a 5 inch canvas pocket and filled with a continuous length of #10 plated jack chain to weigh down the curtain. Leading edges of traveler curtains shall have 6" hem width of face material. Off stage side hems shall be 4 inches wide. Valance curtain fabrication shall be the same as for the draw curtains, except it shall be in one continuous piece extending across the proscenium opening, and the side hems and bottom hem shall be 2 inches wide. Omit chain and pocket in bottom hem.

5. WEATHER BARRIER:

Provide and install TYVEK Commercial Wrap as manufactured by DUPONT including all related accessories (seam tape, flashing, fasteners... etc.) for installation as required by DUPONT; install over plywood sheathing walls and wall element configurations.

END OF SECTION

TOILET COMPARTMENTS

PART 1 - GENERAL

- 1.01 REFERENCE:
Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.
- 1.02 DESCRIPTION:
A. Principal Work Items Are:
1. Toilet compartments.
- B. Related Work Specified Elsewhere:
1. Tile: Section 09300.
2. Toilet and Bath Accessories: Section 10800.
3. Plumbing: Division 15.
- 1.03 SUBSTITUTIONS:
Only written approval of the District will permit substitutions for materials specified. Refer to Section 00700, Article 30, Substitutions, for procedure.
- 1.04 SUBMITTALS:
A. Shop Drawings and Product Data: Submit for all work, reference to District's detail numbers, four copies.
- B. Samples: Manufacturer's standard colors, in duplicate.
- 1.05 JOB CONDITIONS:
Sequencing, Scheduling: Coordinate installation with plumbing, toilet accessories, and other related work.

PART 2 - PRODUCTS

- 2.01 PARTITIONS:
A. Acceptable Manufacturers and Products:
1. Santana Products Co.
- B. Materials:
1. Toilet partitions shall be overhead braced, floor mounted, with noncorrosive panels, doors, and pilasters similar and equal to Poly-Mar HD partitions as manufactured by Santana Products Company, Incorporated, Soraton, Pennsylvania, 18501, Series 1000.
2. Panels, doors and pilasters shall be fabricated from polymer resins under pressure forming a single component section, which is waterproof, nonabsorbent

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TOILET COMPARTMENTS

and has a self-lubricating surface that resists markings with pens, pencils, or other writing utensils. All plastic to arrive at job site with special protective plastic covering.

3. Color Selections:
 - a. To be selected from manufacturers full range.

- C. Construction:
 1. Single component construction of solid Poly-Mar HD in color that extend from the surface throughout the core.
 2. Panels, and pilasters shall be 1" thick and all edges machined to a radius of .250" and all exposed surfaces to be free of saw marks (no other thickness acceptable).
 3. Dividing panels shall be 55" high and mounted at 14" above finished floor. Aluminum edging strips shall be fastened to the bottom edge of all panels full length.
 4. Doors shall be 55" high and mounted at 14" above finished floor. Aluminum edging strips shall be fastened to the bottom edge of all doors full width.
 5. Pilasters shall be 82" high and fastened to 3" high shoes fabricated from Poly-Mar HD material single construction with color throughout with theft proof stainless steel sex bolts.
 6. Finish of doors, panels, and pilasters shall be similar and equal to Santana Products Company, Incorporated "Plasti-Glaze 280".

- D. Hardware:
 1. Door hardware shall be as follows:
 - a. Self Closing Hinges shall be fabricated from heavy aluminum extrusion (6463-T5 alloy) with bright dip anodized finish with wraparound flanges, surface mounted and thru-bolted to doors and pilasters with one-way sex bolts. Hinges will be factory set to a full close position unless otherwise noted.
 - b. Each door shall be furnished with (1) coat hook/bumper of heavy chrome plated Zamak with rubber bumper. (Accessible doors also include: (2) door pulls (both sides) and (1) wall stop). Provide loop or U-shaped handle immediately below latch.
 - c. Door strike and keeper shall be fabricated from heavy aluminum extrusion (6463-T5 alloy) with bright dip anodized finish with wraparound flange, surface mounted and thru-bolted to door with one-way sex bolts.
 - d. Door latch housing shall be fabricated from heavy aluminum extrusion (6463-T5 alloy) with bright dip anodized finish, surface mounted and thru-bolted to door with one-way sex bolts. Slide bolts and button shall be heavy aluminum with "tough coat black" finish thru-bolted to doors and pilasters with one-way sex bolts. The latch shall be flip-over style, sliding hardware not requiring the user to grasp or twist; Provide loop or U-shaped handle immediately below latch.
 2. Pilaster shoes shall be anchored to finish floor with number 5 plastic anchors and number 14 stainless steel Phillips head screws.

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3. Full length continuous wall brackets (shall be Ploy-Mar HD) weighing not less than .822 pounds per linear foot, as manufactured by Santana Products Co. Brackets shall be used for all panels to pilaster, pilaster to wall and panel to wall connections. Wall brackets shall be predrilled by manufacturer with holes spaced every 6" along full length of brackets. Wall brackets shall be thru-bolted to panels and pilasters with one-way sex bolts. Attachment of bracket to adjacent wall construction shall be accomplished by (1) theftproof Zmac mushroom nail in head anchor directly behind the vertical edge panels and pilasters at every 12" along the full length of bracket and (2) No. 5 plastic anchors and No. 14 x 1 1/4 stainless steel Phillips head screws at each 12" interval alternately spaced between anchor connections.
4. Headrail shall be heavy aluminum extrusion (6463-T5 alloy) with mill finish in anti-grip configuration weighing not less than 1.18 lbs. per linear foot similar and equal to Santana Products Company, Incorporated in Section 58993. Headrail shall be fastened to tops of pilasters and headrail brackets by thru-bolting with one-way sex bolts.
5. Headrail bracket shall be of 16 gauge stainless steel.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Erection of partitions, etc., shall be in accordance with the manufacturer's standard recommendations and the following:
 1. All parts shall be erected in a substantial manner, straight, level and plumb.
 2. No evidence of drilling, cutting or patching shall be visible in the finishes of work.
 3. Finished surfaces shall be cleaned after installation and left free of imperfections.

3.02 ADJUSTMENT AND CLEANING:

- A. Clean partitions.
- B. Adjust and lubricate moving parts so all function properly.

END OF SECTION

WALL AND CORNER GUARDS

PART 1 - GENERAL

1.01 SCOPE:

Furnish all material, labor, equipment and services necessary to furnish Wall and Corner Guards, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 WORK FURNISHED BUT NOT INSTALLED:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
06-200	FINISH CARPENTRY

1.03 ACCEPTABLE MANUFACTURERS:

- A. "Decrovin" products from CONSTRUCTION SPECIALTIES.
- B. Approved equivalent.

1.04 SUBMITTALS:

- A. Submit Shop Drawings in accordance with Section 01-300 Submittals.
- B. Submit color samples from Manufacturer's currently available standard range to the Architect for color selection.

PART 2 - PRODUCTS

2.01 INTERIOR WALL AND CORNER GUARDS (Note: Wall guard not applicable)

- A. Wall guards: "ACROVYN" Model #SCR-64.
 - 1. Materials - Vinyl/Acrylic.
 - 2. Mounting - Mechanically attached according to manufacturer's recommendations.
- B. Corner guards: "ACROVYN" Model # LG-200, (2 inch x 2 inch x 8 feet) Lexan corner guards with chrome plated sheet metal screws at 18 inches o.c.max. When wall height exceeds 8, feet, splice to be placed near the ceiling at the highest point practical for full height installation.

PART 3 - EXECUTION

Installation specified in Section 06-200 Finish Carpentry.

END OF SECTION

PLASTIC PLAQUES

PART 1 - GENERAL

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish Plastic Plaques in accordance with the latest Americans with Disabilities Act (ADA & CBC), accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK FURNISHED:

00-700 GENERAL CONDITIONS
00-750 SUPPLEMENTAL GENERAL CONDITIONS
06-200 FINISH CARPENTRY

1.03 ACCEPTABLE MANUFACTURERS:

- A. VOMAR PRODUCTS INC.
 - 1. Products from the following manufacturers are approved equivalent subject to the requirements of the specification and the drawings: MOHAWK SIGN SYSTEMS, INLAND PACIFIC SIGNAGE CO., or approved equivalent.

1.04 SUBMITTALS:

- A. Submit Shop Drawings in accordance with Section 01-300 SUBMITTALS including letter spacing and indications of compliance with the ADA and CBC, the State of California Access Compliance Section of the Office of the State Architect.
- B. Submit color samples from Manufacturer's currently available standard range to the Architect for color selection.
 - 1. Provide the following minimum color choices:
 - a. Subsurface colors20 colors
 - b. Subsurfaces shades of white to black.....5 minimum
 - c. Surface colors20 colors
 - d. Surface shades of white to black.....5 minimum

1.05 QUALITY ASSURANCE:

- A. Obtain products from a single source with resource to provide products of consistent quality in appearance and physical properties without delaying the progress of the Work.
 - 1. Engage an experienced installer who has successfully completed signage installations similar in material, design, and extent to those indicated for the Project.
- B. Contracted Grade 2 Braille information required on signs is the responsibility of the manufacturer as to text translation and compliance with the Title 24 (CBC).
- C. All signage must be field inspected after installation per CBC 11B-703.1.1.2

PART 2 - PRODUCTS

2.01 INTERIOR PLASTIC PLAQUES

- A. Signs indicated below are from VOMAR PRODUCTS INC.. Other manufacturer's listed are approved subject to the requirements of this specification.
1. Similar to the 100 Series Plaques unframed plaques as manufactured by VOMAR PRODUCTS INC., or approved equivalent.
 2. Material:
 - a. Plaque – 0.125” thick opaque acrylic, non-glare finish, contrasting core color. Color of face and core as selected by the Architect from the manufacturer's full color line. Note: .25” thick at restroom doors.
 - b. Lettering - Tactile Sans Serif upper case, 5/8 inch size characters and symbols (where required), raised the required 1/32 inch from sign face. Provide Grade 2 Braille below copy.
 - c. Perimeters: Borderless with background color; a minimum of 3/8 inch. radius @ corners.
 3. Mounting:
 - a. Concrete, metal, gypsum wallboard, cement plaster or veneer plaster surfaces: Provide SCOTCHMOUNT foam tape for sign back-up plate for temporary positioning and “Silastic Adhesive” for permanent attachment to back-up plate.
 - 1) Adhesive bead shall be 3/16 inch wide minimum and 1/2 inch minimum from the edge and spaced across the field of the sign 1 inch o.c. minimum horizontally.
 - b. Glass surfaces: Provide SCOTCHMOUNT foam tape for sign back-up plate for temporary positioning and “Silastic Adhesive” for permanent attachment to back-up plate. Provide blank panel of same material on opposite side of glass aligned with the sign itself in color as selected by the Architect
 4. Schedule:
 - a. **Occupancy Signage:** As required by governing agencies (Braille dots not required). Size and location as indicated on drawings. (non-tactile)
 - b. **Accessible Toilet Room Signage:** Pictogram, Raised Text and Braille dots required. Size and location as indicated on drawings.
 - c. **Room Signage:** Raised Text and Braille dots required. Size and location as indicated on drawings.
 - d. **Assistive Listening System Available:** (Braille dots not required) Non-tactile Text and Pictogram. Size and Location as Indicated on Drawings.
 - e. **Exiting Signage:** Raised Text and Braille dots required. Size and location as indicated on drawings.

2.02 EXTERIOR PLASTIC PLAQUES:

- A. Signs indicated below are from VOMAR PRODUCTS INC.. Other manufacturer's listed are approved subject to the requirements of this specification.
1. Similar to the 100 Series Plaques Photopolymer unframed plaques as manufactured by VOMAR PRODUCTS INC., or approved equivalent.
 2. Material:
 - a. Plaque – Match 2.01, A, 2, 9.
 - b. Lettering – Tactile Sans Serif upper case, 5/8 inch size characters and symbols (where required), raised the required 1/32 inch from sign face. Provide California Contracted Grade 2 Braille below copy.
 - c. Perimeters: Borderless with background color a minimum of 3/8 inch radius at corners.
 3. Mounting:
 - a. Concrete, metal, gypsum wallboard, cement plaster or veneer plaster surfaces: Provide SCOTCHMOUNT foam tape for sign back-up plate for temporary positioning and “Silastic Adhesive” for permanent attachment to back-up plate.
 - 1) Adhesive bead shall be 3/16 inch wide minimum and 1/2 inch minimum from the edge and spaced across the field of the sign 1 inch o.c. minimum horizontally.
 - b. Glass surfaces: Provide SCOTCHMOUNT foam tape for sign back-up plate for temporary positioning and “Silastic Adhesive” for permanent attachment to back-up plate. Provide blank panel of same material on opposite side of glass aligned with the sign itself in color as selected by the Architect.
 4. Schedule:
 - a. **Gas Valve:** At exterior Gas Valve locations indicated on the Mechanical Drawings (Braille Dots not required). Size 4” x 10” minimum.
 - b. **Building Accessibility:** Size and location as indicated on the drawings.

PART 3 - EXECUTION

- A. Installation as recommended by the manufacturer, and in accordance with Title 24 (CBC) and local accessibility standards.

END OF SECTION

FIRE FIGHTING DEVICES

PART 1 - GENERAL:

1.01 SCOPE:

Provide all material, labor, equipment and services necessary to furnish and install Fire Fighting Devices, accessories, and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
04-220	CONCRETE BLOCK MASONRY (Recess opening)
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
06-200	FINISH CARPENTRY
09-250	GYPSUM WALLBOARD
09-900	PAINTING

1.03 STANDARDS

In accordance with Section 01-080 Codes and Standards and the following:

NAAMM	National Association of Architectural Metal Manufacturers.
NFPA	National Fire Protection Association (NFPA 10)

1.04 MANUFACTURING STANDARD:

- A. Products in accordance with LARSEN'S MANUFACTURING CO., (612) 571-1181, AMEREX COMPANY, or approved equivalent.

1.05 SUBMITTALS:

- A. Product data in accordance with 01-300 SUBMITTALS.

PART 2 - PRODUCTS

2.01 FIRE EXTINGUISHERS AND CABINETS:

- A. Cabinet and Extinguisher Types:
(5.0 pounds maximum force required to open the door. Provide V" – shape type pull.)
1. Type FEC-1 Semi-Recessed "Architectural Series" where wall depth is insufficient to accept complete box depth.
- a. Model No. AL 2409-6R, for rough opening of 25"H x 10-1/2"W x 4"D. Box is to be fabricated from manufacturer's standard heavy gage steel, white baked enamel box.
 - b. Provide 2-1/2 inch Rolled Edge Trim all around, with all corners mitered.
 - c. Door to be "Vertical Duo" with tempered glass.
 - d. Door and trim to be fabricated from extruded aluminum with a clear satin anodized finish.
 - e. Provide Fire Extinguisher Model No. MP 5 (Multi-Purpose) with a UL Rating of 2A-10B:C. Provide Fire Ext. model No. H9 with U.L. Rating of 1A-10B:C at computer room. Provide Fire Ext. Model WC 2A:K in Kitchen.

2. Type FEC-2: Fully Recessed “Architectural Series” where wall depth is sufficient to accept complete box depth.
 - a. Model No. AL 2409-R1, for rough opening of 25”H x 10-1/2”W x 5-1/4”D. Box is to be fabricated from manufacturer’s standard heavy gage steel, white baked enamel box.
 - b. Provide 5/16 inch Flat Edge Trim all around, with all corners mitered.
 - c. Door to be “Vertical Duo” with tempered glass.
 - d. Door and trim to be fabricated from extruded aluminum with a clear satin anodized finish.
 - e. Provide Fire Extinguisher Model No. MP 5 (Multi-Purpose) with a UL Rating of 2A-10B:C.
3. Type FEC-3: Surface Mounted “Architectural Series”.
 - a. Model No. AL 2409-SM, outside trim dimensions of 27-1/2”H x 13”W. Box is to be fabricated from manufacturer’s standard heavy gage steel, white baked enamel box.
 - b. Door to be “Vertical Duo” with tempered glass.
 - c. Door and trim to be fabricated from extruded aluminum with a clear satin anodized finish.
 - d. Provide Fire Extinguisher Model No. MP 5 (Multi-Purpose) with a UL Rating of 2A-10B:C.

2.03 WALL BRACKET AND EXTINGUISHER:

- A. Bracket and extinguisher type:
 1. Type WB-1: Surface attached wall bracket for MP Series extinguishers (except for MP 20) and extinguisher.
 - a. Model No. B-2 extinguisher bracket, constructed of heavy gage steel with a white baked enamel finish.
 - b. Provide Fire Extinguisher Model No. MP5 (Multi-Purpose) with a UL Rating of 2A-10B:C

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installed in accordance with manufacturer’s instructions.
 1. Fire extinguisher cabinets and fire extinguishers shall be mounted at +48” from top of extinguisher handle to finished floor level.
- B. Install locations as indicated on Drawings.
 1. Verify all rough opening dimensions with manufacturer before construction of the rough opening.
 2. Verify fire-rated wall conditions for substrate protection prior to installation of fire extinguisher cabinets.
- C. Check, inspect and date extinguishers by a licensed serviceman, ready for use.

END OF SECTION

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.01 REFERENCE:

Requirements in Addenda, Alternates, Division 00 General Conditions, and Division 01 General Requirements, collectively apply to this work.

1.02 DESCRIPTION:

A. Principal Work Items Are:

1. Grab bars.
2. Mirrors.
3. Toilet paper dispensers.
4. Toilet seat cover dispensers.
5. Paper towel dispensers.
6. Soap dispensers.
7. Sanitary napkin-tampon vendors and disposal.
8. Shower seats.
9. Hand Dryers Electric.

B. Related Work Specified Elsewhere:

1. Glazing: Section 08801.
2. Toilet Compartments: Section 10160.
3. Mirrors for Educational Casework: Section 12325.
4. Plumbing: Division 15.

1.03 SUBSTITUTIONS:

Only written approval of the District will permit substitutions for materials specified. Refer to Fresno Unified School District's General Requirements, Section 01 25 13, Product Substitution Procedure.

1.04 QUALITY ASSURANCE:

Requirements of Regulatory Agencies: Conform to State Handicapped Regulations.

1.05 JOB CONDITIONS:

Sequencing, Scheduling: Coordinate work with Architect's drawings and related work of other Sections. Verify types of backing prior to installation of items.

PART 2 - PRODUCTS

SECTION 10800
TOILET AND BATH ACCESSORIES

2.01 GENERAL:

- A. Acceptable Manufacturers and Products or approved equal:
 - 1. Bobrick Washroom Equipment, Inc., as a standard of quality.
 - 2. Other Manufacturers:
 - a. American Dispenser Company.
 - b. Accessory Specialties.
 - c. Bradley. D. Hallmack.
 - d. Parker.
 - e. Watrous.
 - f. Fort James
 - g. BayWest

- B. Material and Finish: Unless specifically noted otherwise, exposed surfaces to be Type 304 stainless steel, No. 4 satin finish.

2.02 PRODUCT ITEMS:

- A. Paper Towel Dispensers:
 - 1. Paper Towel Dispenser, Surface mounted, Push Paddle Roll, Model # Georgia Pacific, GPC54338. Provided by District and installed by Contractor.
 - a. This model to be installed at the following:
 - 1) Elementary Schools Student Toilet Rooms
 - 2) Middle Schools Student Toilet Rooms
 - 3) High Schools Student Toilet Rooms
 - 2. Paper Towel Dispenser, Surface Mounted, LEV-R-MATIC Roll, Model # Kimberly Clark, 09736. Provided by District and installed by Contractor.
 - a. This model to be installed at the following:
 - 1) Staff Toilet Rooms
 - 2) Classrooms with sinks

- B. Toilet Tissue Dispensers:
 - 1. Multi-Roll Toilet Tissue Paper Dispenser, Surface Mounted, Model # Bobrick, B-2888, Satin-finish stainless steel.
 - 1) Accessibility Toilet Rooms: Provide Recessed Toilet Tissue Dispenser Model # Bobrick B-3888.
 - 2. Combo Unit Toilet Tissue Dispenser, Surface Mounted, Model # Kimberly Clark, 09551 IN-SIGHT Cored JRT Combo Unit Smoke/Grey, 20.4"x13.1"x5.8". Provided by District and installed by Contractor.
 - a. This model to be installed at the following:
 - 1) Elementary Schools Student Toilet Rooms
 - 2) Staff Toilet Rooms

SECTION 10800
TOILET AND BATH ACCESSORIES

- C. Soap Dispensers:
 - 1. Soap Dispenser-Liquid, Surface Mounted ClearVu Encore Plastic white see-thru, Model # Impact, 9330. Provided by District and installed by Contractor.
 - a. This model to be installed at the following:
 - 1) Elementary Schools Student Toilet Rooms
 - 2) Staff Toilet Rooms
 - 3) Classrooms with sinks
- D. Sanitary Napkin Dispensers:
 - 1. Sanitary Napkin/Tampon Dispensers: Bobrick B-3706. Locations per Architect's drawings.
- E. Sanitary Napkin Disposals:
 - 1. Sanitary Napkin Disposal: Bobrick B-270. Locations per Architect's drawings.
- F. Grab Bars:
 - 1. Grab bars: Bobrick B-6806.99. Locations per Architect's drawings.
 - 2. Grab bar Toilet Partition Anchors: B-258 Series
- G. Mirrors:
 - 1. Polished Stainless Steel Mirrors: Mirror with Stainless Steel Channel Frame, Model # Bobrick B-1656 Series "_x_". Size and locations per Architect's drawings.
 - 2. Tempered Glass Mirrors, Mirror with Stainless Steel Channel Frame, Model # Bobrick B-1658 Series (1/4" tempered glass). Size and locations per Architect's drawings.
- H. Toilet Seat Cover Dispensers:
 - 1. Toilet Seat Cover Dispenser, Surface Mounted, Model # Krystal KRY KD200, Chrome 16w x 3-1/4d x 11-1/2h half-fold.
 - a. Dispenser provided by District and installed by Contractor in all toilet rooms per Architect's drawings.
- I. Electric Hand Dryers:
 - 1. Electric Hand Dryer, Recessed, Model # Bobrick B-750.
 - 2. Electric hand dryers shall be installed in all student restrooms where power is available.

PART 3 - EXECUTION

SECTION 10800
TOILET AND BATH ACCESSORIES

3.01 INSTALLATION:

A. General:

1. Anchorage: Securely anchor all items into solid backing with manufacturer recommended suitable attachments, Phillips-head typical.
2. Mounting Heights: Conform to handicapped requirements for each particular items installed in areas serving the handicapped. Refer to construction drawing.

B. Toilet Accessory Schedule (refer to drawings):

1. Install scheduled items at locations indicated on drawings. Use manufacturer recommended anchor plates.
2. At toilet partitions, use Bobrick 258 Series anchor plates for single grab bar installations.

C. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

D. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION

PROJECTION SCREENS

PART 1 - GENERAL

- 1.01 REFERENCE:
Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.
- 1.02 DESCRIPTION:
A. Principal Work Items Are:
1. Motorized movie screen.
- B. Related Work Specified Elsewhere:
1. Rough Carpentry: Section 06100.
2. Finish Carpentry: Section 06200.
3. Painting: Section 09900.
4. Electrical: Division 16.
- 1.03 SUBSTITUTIONS:
Only written approval of District will permit substitutions for materials specified. Refer to Section 00700, Article 30, Substitutions, for procedure.
- 1.04 QUALITY ASSURANCE:
Products, procedures, and published data by the specified manufacturer herein shall be used as a standard for this work.
- 1.05 SUBMITTALS:
A. Samples: Screen fabric material, in duplicate.
- B. Shop Drawings and Product Data:
1. Submit two copies of drawings for all work.
2. Product Data: Submit two copies of manufacturer's standard brochures describing all materials, and installation instructions.
- 1.06 JOB CONDITIONS:
A. Verify dimensions in field.
- B. Sequencing, Scheduling: Coordinate this work with related work of other Specifications Sections.

PART 2 - PRODUCTS

2.01 MATERIALS, MOTORIZED MOVIE SCREEN:

- A. Type: ELECTRIC PREMIER as manufactured by DRAPER.
1. Size: Screen size 12' height x 12' length, overall case length 12'.
 2. Screen: AV Format Fiberglass matt white, fire-retardant and mildew resistant, fabric viewing surface.
 3. Motor: Underwriters' Laboratory approved, instantly reversible, three-wire controlled gear motor, 60 cycle, 110-120 volt, equipped with an internal, tamper-proof thermal overload protector, with life time lubrication. Fit motor with mechanical brake to eliminate coasting, mount on rubber vibration insulators to minimize noise transmission.
 4. Roller: 5" OD heavy-wall aluminum tube supported by double row, radial ball-bearing roller brackets.
 5. Case: Knot-free hardwood, with prime coat finish. Metal lined motor compartment with hinged panel for easy access to limit switches and controls. Fully enclose case bottom except for slot for screen passage.
 6. Mounting Brackets: Minimum 1/4" thick steel straps formed around case to prevent separation of screen from brackets.
 7. Limit Switches: Pre-set at factory to automatically stop screen in proper "up" and "down" positions. Easily accessible through hinged panel in case.
 8. Control Switch: Provide a key-operated "three-position control switch." that shall stop or reverse screen at any point in its operating cycle without a relay. Furnish controls complete with aluminum box and stainless steel cover plate, engraved with the word "Screen".
- B. Acceptable Manufacturers and Products:
1. "PREMIER" electrically operated projection screen for wall mounted installation by Draper Screen Company, Inc. represented locally by Photo and Sound in El Monte, California, as a standard of quality.
 2. Others: Refer to Paragraph 1.03, Substitutions.

PART 3 - EXECUTION

3.01 INSPECTION:

General: Examine surfaces and rough framing to determine suitability to install screen. Do not start work until unsatisfactory conditions are corrected.

3.02 INSTALLATION:

- A. Install screen, recessed as detailed and horizontal and plumb for proper operation, per manufacturer's recommendations. Securely anchor to supporting structure to withstand all loading conditions and strain of service.

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PROJECTION SCREENS

- B. Power source and final hook-up to unit, interconnection between unit and control switches, and installation of control switches, to be by Electrical, Division 16.
- C. Finishes by respective trades.

3.03 ADJUSTMENT AND CLEANING:

- A. Adjustment: Adjust unit as required for smooth operation and proper alignment of screen when fully suspended.
- B. Cleaning: Just prior to final acceptance of project, clean the screen surface according to the manufacturer's literature.
- C. Protection: Protect completed work from damage until acceptance by District.

END OF SECTION

ATHLETIC & RECREATIONAL EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment and services necessary to furnish and install Athletic Equipment, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
03-300	CAST-IN-PLACE CONCRETE
04-220	CONCRETE BLOCK MASONRY
05-100	STRUCTURAL METAL AND METAL FABRICATIONS
09-670	RESILIENT SHEET ATHLETIC FLOORING
09-900	PAINTING
11-132	PROJECTION SCREENS
DIV.15	MECHANICAL
DIV.16	ELECTRICAL POWER AND DISTRIBUTION (Connection to electrical power)

1.03 STANDARDS:

In accordance with Section 01-080 Codes and Standards and the following:

CIF	California Interscholastic Federation
NCAA	National Collegiate Athletic Association

1.04 QUALITY ASSURANCE:

Products specified are based on Products supplied by PORTER ATHLETIC EQUIPMENT and NEVCO. Products by PERFORMANCE SPORT SYSTEMS INC., TOMARK INC., ADP LEMCO INC. and DAKTRONICS are considered equivalent subject to the requirements of this specification.

1.05 SUBMITTALS:

- A. Product Data: In accordance with Section 01-300 SUBMITTALS
- B. Shop Drawings: In accordance with Section 01-300 SUBMITTALS
- C. Operations Data: In accordance with Section 01-700 OPERATIONS DATA.
- D. Engineer Calculations: For overhead supports in accordance with 01-300.

1.06 JOB CONDITIONS:

- A. Existing Conditions:
 - 1. Field Measurements: Take and be responsible for field measurements as required. Prior to performing Work report any significant differences between field dimensions and Drawings to Architect.

1.07 WARRANTY:

- A. In accordance with Section 01-740 WARRANTIES.
- B. Warranty Period: 5 years; unless otherwise noted.

1.08 MAINTENANCE REQUIREMENTS:

The installer shall maintain a regular service facility within a 200 mile radius of the area in which the project is located and shall furnish regular maintenance service on products installed under this contract for a period of one year after completion. The installer shall be able to offer the owner agreement for continuing maintenance after expiration of maintenance period provided under the contract. All work shall be done during regular working hours of regular working days. The work shall include regular examinations by trained employees and shall include all necessary adjustments, lubrication if any, and parts to keep the products in operation, except parts made necessary by misuse, accidents or negligence by parties other than the athletic equipment installer.

PART 2 - PRODUCTS

2.01 BASKETBALL BACKSTOPS:

- A. Backstop:
 - 1. PORTER Model #B-950-W forward fold backstop; 25 year limited warranty.
- B. Operation
 - 1. Model #00707-000, 3/4 HP, 13 amp, 115V, 60 cycle, single phase, instantly reversible, worm gear motor.
 - 2. Drum: Manufacturer's standard compatible with motor and warranty requirements.
 - 3. Cable: Manufacturer's standard compatible with motor and warranty requirements.
 - 4. Automatic stop at "up" "off" and "down" position.
 - 5. Key Operated with "up" "off" and "down" positions with self-centering to "off position.
- C. Backboard:
 - 1. Rectangular 42 inch x 72 inch tempered float glass backboard with brushed aluminum frame, Model #00208-000.
 - a. Tempered Glass backboards to have safety padding around edges, Model #00227-000.
 - b. Color selection from manufacturer's standard colors.
- D. Goals
 - 1. Tempered Glass Backboards: POWER-FLEX GOAL, "no tie" net clips, Model #00233-02, with 100% Nylon "Anti Whip" net, or approved equivalent.
 - 2. In accordance with NCAA.
- E. Overhead Supports
 - 1. Fastening as required by manufacturer.
- F. Safety Lock:
 - 1. PORTER Model #10797100 "SAF-STRAP" Basketball Backstop Safety Lock.

2.02 FLOORPLATES AND SLEEVES: (Provided by Owner & Contractor installed):

- A. Volleyball floor plates and sleeves to be Model #00873-200 floor sleeve for installation.

2.03 WALL PADDING: Provide 24 lineal feet of wall padding to west wall of Room #1.

- A. Wall Padding shall PORTER #00560-0XX (2" thick") bonded foam filler (firm), 6lb density, or approved equivalent.
1. Panels to be 2'-0" wide by 6'-0" high.
 2. Panels will be constructed of filler bonded to 3/8" plywood backing board and covered with flame retardant, vinyl-coated Nylon fabric, folded and stapled securely to back of plywood. A 1" nailing margin shall be provided to top and bottom for securing panels to the wall.
 3. Vinyl coated nylon covering (color to be selected by Architect from manufacturer's standard color list) shall have a certificate of flame resistance from the State of California (Registered Fabric No. F-140).
 4. The cover material shall have tear strength of 400 psi and shall be mildew and rot resistant and fortified with an infection combating fungicide.
 5. All cutouts in panels shall be made in the field to fit job conditions.
 6. Panels must be inspected before installed. Follow manufacturer's recommendations for proper installation standards. All panels shall be plumb and flat across the visible surface (no concave voids or convex bulges).

2.04 SCOREBOARDS: NOT APPLICABLE

- A. Provide an Electric Basketball/Volleyball/Wrestling Scoreboard Combination Model #8214 by All American, or approved equivalent. Overall size 9'L x 5'H x 5"D.
1. Provide All American Wireless Multi-Sport Console, Model No. 8000 Series Microprocessor-based operator control with all accessories
 2. Provide All American Shot Clocks Model # 8299 at each end of the Gymnasium (locations as indicated on the drawings) controlled by the unit. Shot Clocks complete with Basket and Mounting Box.
 3. Provide dimmer switches, timing switches, team scores, and multi-level lower section keyboard overlays for different sport functions.
 4. Provide two integral horns per scoreboard.
 5. Provide captions that are back lighted, with home, guests, fouls, player, won, game, bout, weight 6" letters, period 9" numerals 1 2 3 4, bonus (B), possession arrows, period, 13" Team Scores.
 6. Provide all accessories including receivers, carrying case, hand held switch and mounting hardware for a complete scoreboard equipment operation.
 7. Power Requirements
 - a. Scoreboard shall be 158 watts. Max 100-240 volts AC with Power Factor Correction.
 - b. Control Center shall be complete with power adapters and receivers.
 8. Warranty: 5 years.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Prior to installation of Athletic Equipment, inspect the installed Work executed under other Sections which affect the installation of Athletic Equipment.
- B. Report unacceptable conditions to Architect. Do not begin Work until unacceptable conditions have been corrected.
- C. Installation of Athletic Equipment shall constitute acceptance of existing conditions.

3.02 COORDINATION:

Coordination athletic equipment with related items specified under other Sections to ensure proper and adequate interface of Work.

3.03 INSTALLATION:

- A. In accordance with manufacturer's instructions and approved installation drawings.
- B. In accordance with regulatory agencies.
- C. In accordance with approved shop drawings.
- D. Provide demonstration and training session for Owner's Representative covering operation and maintenance of scoreboard equipment.

3.04 CLEANING:

In accordance with Section 01-700, PROJECT CLOSEOUT.

END OF SECTION

FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE:

- A. Included: Perform all work necessary and required to complete Food Service Equipment. Such work includes the furnishings of all labor, material and services necessary for a complete, lawful and operating system with all equipment as shown or noted on the drawings or as specified herein. These specifications are intended to cover the installation of Food Service Equipment and all fittings, devices and accessories required to provide complete operational system. The omission from these specifications or from schedules of express reference to any parts necessary for the complete installation is not to be construed as releasing the Contractor from responsibility for furnishing such parts.
- B. Food Service General Notes, Foodservice General Specifications, Foodservice Equipment Specifications, and Foodservice Electrical and Plumbing Schedules form an integral set of food service job specifications relating to the food service portion of this project.
- C. All equipment and fabricated stainless steel counter tops, tables, sinks, and drainbords shall be constructed to N.S.F standards.
- D. All kitchen walls, ceiling and floors shall be surfaced with a washable smooth finish.
 - 1. Stainless steel wall flashing a minimum 10" above all sink units and dish table drainbords to protect wall from abuse and water damage.
 - 2. Floor to be resinous flooring with integral 6" coved base at wall or ceramic tile with adequate slip-resistant surface.
- E. Prime Contractors to co-ordinate with the kitchen contractor to locate and install the required wall blocking for equipment and wall shelf supports.
- F. Kitchen Contractor to provide all topside plumbing fixtures: i.e. water faucets, spray rinse units, basket type sink water with crumb cups, and rotary waste valves. All plumbing fixtures supplied by Kitchen Contractor to be supplied loose in box, to be installed by Plumbing Prime Contractor. (All tall pieces, connecting plumbing both rough and finished, to be completed by Plumbing Prime Contractor.) Kitchen Contractors to provide all rough and final electrical, plumbing and mechanical hook-ups.
- G. Kitchen Contractor to field check the location of all requires electrical, plumbing and mechanical and confirm that they are adequate and correct for the specified equipment as indicated on foodservice electrical and plumbing schedules prior to closing walls and floors. Adequate time shall be given for Kitchen Contractor to respond. Kitchen Contractor to provide all start-up, check-out, and in-service training of kitchen staff on proper use and operation of new kitchen equipment.

1.02 FOOD SERVICE GENERAL SPECIFICATIONS:

A. QUALITY ASSURANCE

- 1. Manufacturers Qualifications:
 - a. Manufacturers and models listed in the Schedule of Foodservice Equipment Specifications are used to establish minimum standards for design, performance, and construction intended.
- 2. Fabricators for custom-fabricated equipment shall have plant, personnel, and equipment suitable to produce the specified items within the time requirements of the construction schedule and carry the NSF label.

- B. Installers Qualifications and Responsibilities:
1. All work shall be installed by experienced craftsman who are employed by an NSF approved shop.
 2. Kitchen Contractor shall be responsible and qualified to coordinate with the Construction Manager on Owner's behalf to field verify all rough plumbing and rough electrical. First field verification shall be done prior to closing of walls and shall include field layout of all required wall blocking for support of kitchen wall hung shelves and equipment and layout of all shafts, platforms and pitch holes in roof system for exhaust hood equipment. Second field verification shall be done prior to when final finish is applied to walls to verify that all utilities are as required and finished wall dimensions will accommodate the specified equipment. If there are any discrepancies a written notification shall be the responsibility of the Kitchen Contractor to both the Owner and the Construction Manager stating both the discrepancy, related problem caused and the proposed remedy at each stage of field verification. Construction Manager shall make provisions for the installation of the required wall blocking, fire rated exhaust shafts, roof platforms, utility pitch holes and rain tight weather safe roof system modification to accommodate kitchen equipment.
- C. Submittals:
1. Shop Drawings: All stainless steel fabricated items shall be drawn dimensioned and show all detail features and specifications.
 2. Manufactured Equipment: All manufactured items will be represented by a current specification sheet detailing all options and accessories, as quoted.
- D. Product Handling and Delivery:
1. No equipment shall be delivered directly on the job site prior to having an installation crew on the premises, except with the written permission of the owner, and/or his designated agent.
 2. Fabricated equipment may be shipped in sections to facilitate entry into the building only as approved by the owner, and/or his designated agent.
- E. Warranties:
1. All warranties and operators manuals for manufactured times shall be put in force with respective manufacturers, and assemble into a 3-ring binder with a numbered index. Supply at start-up date, including manuals of each equipment item.
- F. General Stainless Fabrication Specifications for Foodservice Equipment:
1. Materials:
 - a. All materials shall be new and the best of their respective kinds, without imperfections or defects of any kind.
 - b. Stainless steel shall be US Standard gauge as specified, Type 302, formula 18-8. All exposed stainless steel shall have a standard commercial No.4 finish. Unexposed, stainless steel may have a No. 2B finish.
 - c. Galvanized iron shall be US Standard gauge of a high quality hot rolled steel: sheet coated with a non-flaking zinc which eliminates flaking or peeling when sheets are formed or fabricated, and with a finish suitable for painting.
 - d. Stainless steel tubing shall be US Standard gauge Type 302, as specified, seamless tubing, annealed, pickled and ground smooth. All tubing exposed to view shall have a standard commercial No. 4 finish.

- e. Structural steel shapes, including angles, bars, channel, etc., used for framing or reinforcement, shall be uniform and ductile in quality, free from hard spots, runs, checks, and other surface defects. Where such selections are specified as galvanized, they shall be galvanized by the hot-dip process with all surplus and spelter removed, but especially free of runs and blisters.
2. Workmanship:
- a. Workmanship shall be first class in every respect and in accordance with the best standard practice for this type of equipment and constructed to SMACNA guidelines and NSF standards.
3. Construction Standards:
- a. General: All equipment shall be solidly braced and reinforced to provide rigidity. All joining and connecting to be done in such a manner as to be easily cleaned, dust and vermin tight, and present a neat and finish appearance. All work to comply with NSF standards and carry the NSF label where designated.
 - b. Welding: Welding shall be done with rods of the same materials as the parts being welded. Welds shall be flat without buckles, imperfections, or burns. Welds shall be flat without buckles, imperfections, or burns. Welds shall be ground smooth and polished to match the original finish of the metal to give the appearance of one-piece construction.
 - c. Field Joints: These are provided for the convenience of installation and are to be kept to a minimum. Field joints in tops shall be welded, ground smooth, and polished at the site. Soldered draw-type joints will not be acceptable.
 - d. Grinding and Polishing: All surfaces shall be smooth to the touch, and free of defects. All raw and sheared edges to be ground and polished to a smooth surface free of burrs, projections and fins. All exposed surfaces to have a commercial No. 4 finish, unexposed surfaces may have a No. 2B finish.
 - e. Tables and Countertops: All tables and countertops, backsplashes, and returns shall be 14 gauge stainless steel. Exposed corners shall be rounded. Splashes shall be closed on ends. Tops shall be reinforced on the underside with 16 gauge steel angles and/or channels. All dishtables shall be with a 16 gauge or heavier 4" wide hat channel lengthwise on the centerline of the table, fastened to the underside with welded studs and capnuts on approximate 8" centers to fasten the top securely to the hat channel. All dishtables, draintables, backsplashes, and turned-up edges shall have radius bends in all horizontal and vertical corners and at intersections. Rounded and coved corners with radius bends shall be 0.5" radius, or larger. Turn down tops 2" on flat top tables (items #9 and #10). Dishtables and sinks shall be constructed with a minimum 1.5" sanitary rolled edge (item # 13). Counters and worktops indicated in individual equipment specifications as requiring a marine edge (item #5) shall be designed with a marine edge as specified under SMACNA guidelines.
 - f. Table Legs and Stanchions: Table legs and stanchions shall be 1.625" diameter 16 gauge stainless steel seamless tubing. Legs shall be fitted with a sanitary stainless steel bullet-type foot with not less than 2" adjustment. Legs shall be fitted to tops and sinks by means of rounded, fully enclosed stainless steel gussets, reinforced with a steel bushing and provided with a setscrew to secure the leg. Gussets shall be welded to steel channels 16 gauge or heavier, that are welded to the underside of the tops. 1" stanchions used to support overshelves may be welded to the frame.
 - g. Cross Rails and Tubular Undershelves: Cross rails and tubular undershelves shall be either 1.625" or 1" diameter 16 gauge stainless steel tubing. All welds at cross rails shall be continuous and ground smooth. Tack welds will not be acceptable. Where tubing joins the leg, it is to be shaped to fit contour of leg and be completely welded at the junction. Flattened tubing welds will not be acceptable.

- h. Shelves: Wall shelves and table mounted overshelves shall be constructed of 18 gauge S/S unless specified otherwise, and undershelves shall be constructed of 16 gauge stainless steel. Wall shelves shall be supported by 14 gauge stainless steel triangular brackets attached to walls with approved fasteners. Over table mounted shelves shall be mounted on 1" diameter, or 1.625" diameter stainless steel tubular legs welded to counter or table tops unless specified otherwise in equipment specifications C bolted down brackets are not acceptable. Turn down wallshelves and overshelves 1.5". Turn down undershelves 2". End of shelves shall be turned down, unless individual equipment specifications specify ends to be turned up. Exposed corners shall be rounded. Removable undershelves shall be notched and neatly fitted on stainless steel cross rail supports. Fixed undershelves shall be notched and tightly fitted to legs and welded at all intersections of shelf leg. Shelves shall be reinforced with galvanized or S/S channels on the underside to insure rigidity.
- i. Sinks: Sinks shall be constructed of 16 gauge stainless steel unless specified otherwise in equipment specifications, and integrally formed with tops and backsplashes as indicated on the drawings. All corners shall be rounded vertically and horizontally with a minimum of 0.625" radius meeting in a coved corner. Bottoms of sinks shall be pitched to a die-stamped waste opening. Where two or more sinks are adjacent, partitions shall be double-walled with one-piece continuous S/S front exterior panel. Backsplashes shall be punched for faucets and vacuum breakers as required. Sink shall be equipped with either Fisher 0.5" or 0.75" hot and cold fixtures in accordance with pipe sizes shown on drawings, and as specified. Sinks will be equipped with crumb-style 3-1/2" wastes, or overflow pipes with swill guards, or rotary waste valves in accordance with drawings and specifications. Tube style wall mounted pot racks are a special combination of two 1" diameter tubular stainless steel rails and a 16 ga. S/S full length 4" back ledge with a 4" 90° return to wall to protect the wall from pans and handles and equipment.

G. Inspection:

- 1. Prior to the execution of Work under this section, inspect the installed Work executed by other trades which affect the execution of Work under this section.
- 2. Report unacceptable conditions to owner and/or his designated agent in writing. Do not begin work until unacceptable conditions have been corrected, and/or so directed by Owner and/or his designated agent in writing.
- 3. Execution of Work under this section shall constitute acceptance of existing conditions.

H. Preparation:

- 1. Coordination:
 - a. Kitchen Contractor to coordinate with Construction Manager and the electrical and plumbing Prime Contractors by taking field measurements during the course of construction and confirm correct locations before closure of walls as outlined under other sections for these specifications, and Foodservice General Notes.
- 2. Field Measurements:
 - a. Report any significant differences between field dimensions and drawings to owner and/or his designated agent.

- I. Installation:
1. General:
 - a. In accordance with regulatory agencies.
 - b. In accordance with reviewed, approved and signed shop drawings.
 - c. In accordance with manufacturer's specifications, instructions and recommendations, unless specifically noted otherwise.
 2. Equipment shall be squared, leveled, and secured to the structure with approved fasteners as required. Freestanding equipment shall be squared and leveled, ready for electrical and plumbing connections by general contractor.
 3. Where Foodservice Equipment abuts other surfaces, provide trim strips and/or sealant approved for foodservice applications. Joint Sealers to completely seal against entrance of food particles or vermin.
- J. Testing:
1. Foodservice Equipment representative shall be present at times of mechanical and electrical systems check and shall test and check all Foodservice Equipment. If inspection or test show defects, such defects all be corrected and inspected, test repeated.
- K. Cleaning Upon Completion of Portions of the Work:
1. Clean completed Work in accordance with manufacturer's recommendations.
 2. Clean Work as required by Work being applied to it.
 3. Clean adjacent surfaces that were soiled as a process of performing work.
 4. Leave Work ready for final cleaning.
- L. Final Cleaning:
- a. "Clean", when used in this Article, shall be interpreted as meaning broom clean, free of all dust and foreign material generated as result of foodservice equipment fabrication and foodservice installation.
 - b. In accordance with manufacturers/installers recommendations, remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces.
 - c. Polish surfaces, so designated, to shine finish.
 - d. Repair and touch-up marred surfaces caused as a result of work in this section to specified finish to match adjacent surfaces.
- M. Completed Work:
- Completed work shall be inspected for accordance by the Owner and/or his designated agent. Any damage or disfigurement prior to final shall be the responsibility of the trade causing the damage or disfigurement.

END OF SECTION

WALK-IN COOLER AND FREEZER

PART 1 - SCOPE

1.01 SCOPE:

A. Included: Perform all work necessary and required to complete construction as indicated. Such work includes the furnishings of all labor, material and services necessary for a complete, lawful and operating combination walk-in freezer system with all equipment as shown or noted on the drawings or as specified herein. The work includes, but is not necessarily limited to the following:

1. Insulated panels
2. Refrigeration
3. Accessory equipments

These specifications are intended to cover the installation of compressors, condensers, coils, condensing units and all other fittings, devices and accessories required to complete the refrigeration plans and schedules. The omission from these specifications or from the refrigeration plans and schedules of express reference to any parts necessary for the complete installation is not to be construed as releasing the Contractor from responsibility for furnishing such parts.

B. Work Specified Elsewhere:

1. Line voltage power wiring (60 volts or greater), motor starters in motor control centers, and disconnect switches are included in the Electrical Division, unless noted.

1.02 REFERENCE:

Enclosures shall be listed by the National Sanitation Foundation and its design and construction shall meet N.S.F. standard #7, and bear its seal of approval.

1.03 LOCAL CODES, REGULATIONS AND PERMITS:

All materials shall be in full accordance with local and /or state ordinances, and with any other prevailing rules and regulations regarding hazardous equipment.

1.04 WARRANTIES:

- A. Panel Warranty: The foamed-in-place panels to be free from defects in material and workmanship under normal use for a period of 15 years from the date of original shipment. All hardware, fiberglass panels and electrical Components shall be warranted against defects in workmanship under normal use and service for a period of 18 month labor/service warranty from date of completion of project and acceptance by Owner.
- B. Refrigeration Warranty: The refrigeration equipment and components are to be free from defects in material and workmanship under normal use and service for a period of 18 month labor/service warranty from date of completion and acceptance by Owner.
- C. Extended Warranty: Provide four year extended warranty on motor compressor.

1.05 SUBMITTALS:

- A. General: Comply with pertinent provisions of the General Conditions.
- B. Shop drawings: Shop Drawings, along with catalog cuts, templates, and erection and installation details, as appropriate, shall be submitted. Submittals shall be complete in detail; shall indicate thickness, type, grade, class of metal, and dimensions; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction.

PART 2: MATERIALS

2.01 INSULATED ENCLOSURES: MANUFACTURED BY MASTER-BUILT

Panels by Master-Built or equal shall be prefabricated, all metal clad and sectionally constructed for accurate and simple field erection. Panel thickness 4". The size shall be as shown on drawings. Panels shall consist of foamed-in-place polyurethane insulation, sandwiched between interior and exterior metal "skin" which has been die-formed and gauged for uniformity in size. Edges of panels shall be foamed-in-place tongue and groove with Cam-Lock System facilities foamed-in-place at time of fabrications.

2.02 FINISH:

The panel finish shall be 26 gauge Acrylic coated stucco galvalume. Finishes in accordance with USDA publication "Accepted Meat and Poultry Equipment", MPI-2. Provide sample.

2.03 INSULATION:

The individual panels shall be insulated with foamed-in-place polyurethane binding tenaciously to the metal skins to form a rigid panel. The Class I insulation shall be certified by Underwrites' Laboratories as having a flame spread of 25 or lower and smoke generation of 450 or lower when tested in accordance with ASTM 8-84-76. This designation is not intended to reflect hazards presented by this or any other material under actual fire conditions. The thermal conductivity factor shall not exceed 0.115 BTU per hour per square foot per degree Fahrenheit per inch. Overall coefficient of heat transfer (U) factor shall not exceed .033 and 4" walls. Insulation shall have a 97% closed cell structure.

2.04 SECTIONAL FASTENERS:

Assembly of walk-in shall be accomplished by Cam-Lock. Cam-lock shall be foamed-in-place and activated by a hex wrench provide by the manufacturer. Access ports to locking devices shall be covered by snap caps. Access ports shall be on interior to allow assembly of walk-in from the inside.

2.05 GASKETS:

All sectional panels shall be joined together by a double row of vinyl foam gasket at the interior and exterior edges. They will provide a panel-to-panel self-sealing air-tight joint. Gaskets shall be resistant to damage from oil, fats, water, detergents and sunlight.

2.06 DOORS AND DOOR PANEL:

Each walk-in shall be fitted with standard 36" wide swing-type entrance door. The door shall be flush type, finished in and out to match the wall in which located. Doors and door section shall be listed by Underwriters Laboratories and equipped with the following:

- A. Door shall be equipped with magnetic gasket, heavy duty door closure and latch. Hardware has provisions for locking and a safety release which prevents entrapment of personnel within the box.
- B. Door shall be self-closing with two strap-type, spring loaded hinges.
- C. Door jamb shall be made of Fiberglass Reinforced Plastic. An isolated, low wattage heater strip covered by magnetically attracting stainless steel shall be fitted onto this jamb (freezer only). This strip shall provide perfect sealing of magnetic gasket and prevent frost and condensation build-up.
- D. Each entrance door section shall be provided with an incandescent type vapor-proof light, pilot light switch and conduit between switch box and outlet box. Concealed wiring shall be standard on each entrance door section.
- E. A threshold with non-skid stripping shall be provided with each door section. Heater wire shall continue beneath the threshold (freezer).
- F. A 3" dial thermometer shall be included with each door section to indicate inside temperature.

2.07 DOOR ACCESSORIES:

- A. Digital thermometers shall be mounted on door panel exterior.
- B. A Pilot Light and Switch shall be mounted on each door frame exterior. The indicating red or amber light shows when interior light is burning. All parts shall be U.L. listed, 15 amp capacity, and ready for jobsite electrical connection.
- C. Heater cable accessory for freezer. Heater cable wires, 115 volt, U.L listed, shall be concealed behind the metal edge of the of the door jamb on three sides and sill which shall be connected to an "Energy-saving Condensation Control" thermostat for low temperature ice and humidity protection.
- D. A Tri-Action air vent shall be provided to equalize pressure between the interior and exterior, caused by sudden temperature changes due to door openings and evaporator defrosting. The vent shall be heated to prevent moisture and/or frost accumulation (required for freezer).

2.08 VAPOR PROOF LIGHTS:

Incandescent vapor-proof light fixtures shall be provided at each door.

2.09 REFRIGERATION:

- A. The Contractor shall furnish and install any necessary refrigerant piping, fittings, vibration eliminators, line valves, solenoid valves, crankcase pressure regulating valves, thermostatic expansion valves, dehydrators, strainers, sight glasses, moisture indicators, refrigerant, oil, filters, insulation, and all fittings and accessories necessary to make a complete installation unless otherwise specified together with all labor required to complete the installation and perform the service covered by this specification. The Contractor shall familiarize himself with the project, and shall cooperate with other Contractors doing work on the building. If any conflict, interference, or discrepancies come to the attention of the Contractor, he shall notify the Owner immediately before proceeding any further with the installation.
- B. Refrigerants: Refrigerants used shall be per plans.
- C. Refrigerant Piping Materials: Unless otherwise specified, all refrigeration grade Type K hard drawn decreases sealed copper tubing.

All sweat-type fittings shall be wrought copper or forged brass. All elbows and return bends shall be of the long radius type. If flare fittings are required, they shall be of the frost proof type and constructed of forged brass. Soldered joints are referred and shall be used whenever practical.

- D. Remote-Preassembled System: Condensing unit shall include motor-compressor, condenser, receiver, motor starter assembly or contactor, pressure control, liquid filter-drier, sight glass, vibration eliminator (as required), suction filter and control panel assembled on a common base. Condensing units shall be fully hermetic or semi-hermetic type. Condenser shall be air-cooled or optional water-cooled. Condensing units shall be factory assembled and UL or ETL listed. Systems operating below 35-1/2 F. shall include a suction accumulator and defrost kit with time initiate, temperature terminate time clock and defrost heater contractors factory mounted and wired on the condensing unit. Evaporator housing shall be aluminum or have a non-corrosive finish. Evaporators shall be forced air type. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards multi-fin and tube-type coil, shall be housed in heavy gauge aluminum. Unit shall have drain pan with suitable drain pipe fitting. Freezer evaporators shall have an automatic electric defrost system including heater, time clock, fan delay control, and heated drain pan. Defrost shall be time initiated and temperature terminated with built-in fail-safe control. All evaporators shall be UL listed. All systems include pump down cycle to provide additional protection against unwanted refrigerated flow. The coil shall have copper tubes expanded into aluminum fins. All fan motors shall be life lubricated and thermally protected. Electric defrost shall be provided on evaporators operating below 35-1/2 F. Coils and drain pans shall be electrically heated. The evaporator housing shall include space for concealing the TX valve. The solenoid valve, thermostat, heat exchanger and TX valve shall be supplied loose for field mounting by the Mechanical Contractor.

2.10 DRAIN LINES:

Installing contractor shall provide suitable drain lines from all evaporators. Drains shall be trapped outside the walk-in. Freezer drains shall be copper tubing and shall be heated and insulated to prevent freeze-up. All plumbing to be in accordance with local codes.

2.11 MEMBRANE ROOF PACKAGE: NOT APPLICABLE

Provide single-ply membrane roof to waterproof enclosure roof panels; provide positive roof slope minimum 1/2" per foot of travel.

PART 3: EXECUTION

3.01 REFRIGERANT PIPING INSTALLATION:

- A. Tubing shall be installed in a neat, workmanlike manner with horizontal runs sloped toward the compressor at a rate of 1" per 20'. All lines shall be supported at intervals of not more than 8' and suitability anchored. Rubber grommets shall be used between tubing and clamps to prevent line chafing. Where vertical risers of more than 5 feet occur in a suction line, the riser shall be trapped at the bottom.

Individual fixture or unit suction and liquid lines shall be of the size recommended by the Manufacturer as shown in the applicable installation and service instructions. Liquid and hot gas refrigerant lines shall be sized in accordance with good industry practice to avoid excessive pressure drops. Branch and main suction lines shall be sized to maintain adequate velocities to properly return oil to the compressor under minimum load conditions at the lowest saturated suction pressure to be expected. In order to avoid damage to the internal Silfos joints in vibration eliminators, line connections to vibration eliminators are to be made with a silver solder alloy such as Easy-Flo having a melting temperature of 900-1/2 F. or 1,200-1/2 F. All exposed suction lines, both low and medium temperature, shall be insulated as necessary to prevent condensation. Insulation shall be of the cellular type, such as Armstrong "Armaflex" or equal, shall fit the tubing snugly, and shall be applied and sealed in accordance with the manufactures' instructions. Arrange the piping so that normal inspection and servicing of the compressor and other equipment is not hindered. Do not obstruct the view of the crankcase oil sight glass or run piping so that it interferes with removal of the compressor or other components.

- B. Installation of accessories: Vibration eliminators shall be installed in the suction and discharge lines of all compressors with spring or flexible mounting. The vibration eliminator must be applied according to the manufacturer's recommendations. A combination liquid sight glass and moisture indicator shall be installed in each system and located for easy visibility. If liquid line driers are not otherwise specified, they shall be of the filter-drier type, and of the size recommended by the manufacturer. Drier cartridges shall not be installed until the second evacuation has been completed. A thermostat and solenoid valve shall be installed in each system.
- C. Drain Connectors: Unless otherwise specified, condensate drains from coils to the floor drain will be the responsibility of the Contractor. All condensate lines from refrigerated fixtures must be trapped.
- D. Condensing Units: Condensing Units shall include moto-compressor, condenser, receiver, motor starter assembly or rigid structural base and pressure control assembled, piped and wired by the manufacturer. The moto-compressor shall be of the fully hermetic or accessible hermetic type and shall include inherent or solid state motor protection. Condensing units in ambient temperatures below 55-1/2 F. shall include a crankcase heater and head pressure control. Air cooled compressors shall have a flooded type head pressure and auxiliary cooling can as provided.
- E. Evaporators: The housing shall be aluminum or have non-corrosive finish. The coil shall have copper tubes expanded into aluminum fins. All fan motors shall be life lubricated and thermally protected.

END OF SECTION

GYMNASIUM TELESCOPING SEATING

PART 1 - GENERAL

1.01 SCOPE:

- A. This Section includes the following.
 - 1. Wall-attached telescoping seating.

1.02 DEFINITIONS:

Telescoping seating are operable systems of multiple-tiered benches on interconnected, folding platforms that close, without being dismantled, into a nested stack for storing or moving.

1.03 PERFORMANCE REQUIREMENTS:

Structural Performance Characteristics: Engineer, fabricate, and install telescoping stands to withstand the design loads specified in 2022 CBC, Chapter 16A IR 16-5.16 and ICC 300 2017; without exceeding the allowable design working stresses of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each telescoping seating unit.

1.04 SUBMITTALS:

- A. General:
 - 1. Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
 - 2. Design Criteria:
 - a. Rise $\pm 10''$, Row Spacing: $\pm 22''$.
 - b. Provide layouts for each run of bleacher showing rows, aisles, end aisles rail, intermediate aisles steps, handicap seating provisions, vinyl end curtains, wall connections, electrical outlet locating and switching requirements, etc. All these listed components shall be provided and installed as part of the this Section. Layouts to be based on nominal telescoping shown on the Architect's Drawings.
 - c. Provisions of seating for the physically disabled shall meet the requirements of Title 24 as enforced by DSA.
 - B. Product Data for each telescoping seating specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
 - C. Shop Drawings showing fabrication and installation of telescoping seating including plans, elevations, sections, details of components, and attachments to other units of Work.
 - D. Wiring diagrams from manufacturer for electrically operated units.
 - E. Samples for initial selection in the form of manufacturer's color charts consisting of actual units or sections of units showing the full range of colors, textures, and patterns available for each material involving color selection.
- responsibility of
seating unit sizes as
- exposed

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- F. Samples for verification of the following items, in the size indicated below. Prepare Samples from the same material to be used for the Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- G. Qualification data for firms and persons specified in the “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Maintenance data for telescoping stands, including detailed instructions for operation and annual inspection requirements of authorities having jurisdiction, to include in the operation and maintenance manual specified in Division 1.

1.05 QUALITY ASSURANCE:

- A. NFPA Standard: Comply with requirements of NFPA 102, “Standard for Assembly Seating, Tents, and Membrane Structures,” Chapter 5, “Folding and Telescopic Seating,” except where more stringent requirements are indicated or imposed by authorities having jurisdiction.
- B. Installer Qualifications: Engage an experienced Installer to perform work of this Section who has specialized in installing types of telescoping seating similar to those required for this Project and who is acceptable to, or certified by, manufacturer of telescoping seating.
- C. Design Professional Qualifications: A licensed Architect or Structural engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of telescoping stands that are similar to that indicated for this Project in material, design, and extent.
- D. Welding Standards: Comply with applicable provisions of AWS D1.1 “Structural Welding Code-- Steel” and AWS D1.3 “Structural Welding Code -- Sheet Steel.”
 - 1. Engage certified welders that have satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, have undergone recertification.
- E. Engineering Responsibility: Engineer telescoping seating by qualified professional engineer legally authorized to practice in jurisdiction where Project is located.

1.06 PROJECT CONDITIONS:

- A. Field Measurements: Check actual dimensions of construction affecting telescoping seating by accurate field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating telescoping seating without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
1. Interkal Spectator Seating
 2. Irwin Telescoping Seating; Model 4500.
 3. Hussey Seating Company.

2.02 COMPONENTS:

- A. General: Provide manufacturer's standard telescoping seating fabricated to comply with requirements indicated. Smoothly round corners, edges, and exposed fasteners to eliminate snagging and pinching hazards. Form exposed sheet metal with flat, flush surfaces, true to line and level, and without cracking and grain separation. Perform welding by operators and processes complying with AWS requirements.
- B. Bench Seats and Skirts: Provide seats with uniform heights as standard with manufacturer.
1. Material: Plastic Seating Modules; color to be selected from manufacturer 15 standard colors.
 2. Profile: Contoured Seat Module.
 3. Depth: 10 inches.
- C. Cutouts for wheelchair accessible seating at first tier locations as shown. Provide front rails attached to front of second tier at rear of wheelchair accessible seating area. Provide full-width front closure panel at cutout that matches decking construction and finish and extends from underside of second tier to 1-1/2 inches from finished floor.
- D. Risers: Fabricate risers from steel sheet with painted or galvanized finish, as standard with manufacturer.
- E. Footrests: Fabricate fully closed footrests from plywood, as standard with manufacturer.
- F. Understructure: Fabricate understructure from structural steel members of size, spacing, and form required to support design loads.
1. Cantilever module seat supports to produce toe space uninterrupted by vertical bracing.
- G. Support Column Wheels: Provide manufacturer's nonmarring, soft, rubber-face wheel assembly under each support column. Include wheels of size, number, and design required to support stands and to achieve smooth operation without damage to flooring surface, but not less than 4 per column or less than 3-1/2 inches in diameter and 1 inch wide.
- H. Aisles: Fabricate stands with the following aisle configuration, at locations and of widths indicated.
1. Footrest-Level Configuration: Interrupt seats to provide aisle walking surfaces at footrest level.
 - a. Provide manufacturer's standard automatic aisle closures to produce flush vertical face at aisles when system is stored.
- I. Row Spacing: Fabricate units with row spacing of 22 inches, unless otherwise indicated.
Row Rise: Fabricate units with row rise of 10 inches.

- J. Operation: Provide telescoping seating incorporating manufacturer's standard system of seating and understructure members that permit opening and closing of adjacent rows, allow individual and collective rows to be locked open for use, and close with vertical faces of upper skirts in the same vertical plane.
1. Tractive Electric Operation: Provide manufacturer's standard integral power operation of telescoping stands by a series of electric-motor-driven units mounted under first rows that apply tractive force to floor. Provide units with rubber rollers or tracks that will not mar or damage floor over which stands move. Control units by key-operated switch in wall-mounted control station.
 2. Nontractive Electric Operation: Provide manufacturer's standard integral power operation of telescoping seating by electric-motor-operated pusher linkage and reel system that does not apply tractive force to floor. Provide linkage system fitted with rollers on every link to allow chains to roll smoothly across floor. Control units by plug-in, walk-along pendant switch or remotely, by key-operated switch in wall-mounted control station, as standard with manufacturer.
 3. Tractive or nontractive electric operation, at Contractor's option. Provide the following in either case.
 - a. Limit Switches: Provide open and closed limit switches that automatically stop the integral power system when telescoping stands reach the fully opened or closed positions.
 - b. Motion Monitor: Provide flashing light with self-contained warning horn, rated at 85 decibels (dB) at 10 feet, mounted under telescoping seating for audio and visual warning during integral power operation.
 - c. Provide transformer, if required, to coordinate current characteristics of motor and control station with building electrical system.
- K. Types of Telescoping Stands: Provide assemblies of the following types, fabricated in lengths and number of rows indicated. Wall-Attached Type: Construct stands to provide for permanent attachment of rear of understructure to wall construction.
- L. Accessories: Provide the following accessories of manufacturer's standard design and construction at locations indicated or required to comply with reinforced code standard:
1. Nonslip abrasive tread nosings at vertical aisles; walkways to be standard Poly Deck over plywood.
 2. Intermediate aisle steps, fully enclosed, at each vertical aisles.
 3. Transitional top step, fully enclosed, at each vertical aisle where last row of telescoping seating is adjacent to a cross aisle.
 4. Self-storing flip up front steps, fully enclosed, at each vertical aisle, that engage with front row to prevent accidental separation or movement and are equipped with a minimum of 4 nonskid feet.
 5. Aisle handrails located at centerline of each vertical aisle and discontinuous with gaps or breaks at intervals not exceeding 5 rows. Equip handrails with an intermediate horizontal handrail below the top rail.
 6. End railings of self-storing type.
 7. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
 8. Gap fillers for closing openings between stand units or between stand units and adjoining construction.
 9. Telescoping end curtains covering exposed ends of stands in stored position.
 10. Removable scorer's table that attaches to mounting sockets provided as part of telescoping seating.

2.03 STEEL FINISHES:

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel complying with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Rust-Inhibitive Finish: Immediately after cleaning and pretreating, apply manufacturer's standard rust-inhibitive finish to exposed and concealed metal surfaces including understructure, except where other types of finishes are indicated.
 - 1. Epoxy Finish: Manufacturer's standard epoxy-resin-based finish consisting of prime coat and topcoat.

2.04 WOOD FINISHES:

- A. Transparent Finish: Manufacturer's standard wear-resistant finish in manufacturer's standard color.
- B. Painted Plywood: Manufacturer's standard wear-resistant finish in manufacturer's standard color.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examine areas where telescoping seating are to be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of telescoping seating. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

- A. Install telescoping seating to comply with manufacturer's instructions and Shop Drawings. Provide accessories indicated and anchors, fasteners, inserts, and other items required for installing and attaching units to adjoining construction.

3.03 ADJUSTING AND CLEANING:

- A. On completion of installation, including work of other trades, lubricate, test, and adjust each telescoping seating unit to operate easily and to comply with manufacturer's specifications.
- B. Clean installed telescoping seating on exposed and semi exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.04 DEMONSTRATION:

- A. Engage a factory-authorized service representative to demonstrate and train Owner's maintenance personnel as specified below.
 - 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 2. Train Owner's maintenance personnel on procedures and schedules related to operation, trouble shooting, servicing, inspection, and maintenance.
 - 3. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Contract Closeout"
 - 4. Schedule training with Owner, through Architect, with at least 7 days' advance notice.

3.05 PROTECTION:

Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure telescoping seating are without damage or deterioration at the time of Substantial Completion.

END OF SECTION

WHEELCHAIR LIFT

PART 1 - GENERAL

1.01 SCOPE:

Provide all materials, labor, equipment and services necessary to furnish and install a Wheelchair Lift, accessories, and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

00-700	GENERAL CONDITIONS
00-750	SUPPLEMENTAL GENERAL CONDITIONS
01-300	SUBMITTALS
01-740	WARRANTIES
03-300	CAST-IN-PLACE CONCRETE
06-100	ROUGH CARPENTRY
06-200	FINISH CARPENTRY
09-660	RESILIENT TILE FLOORING
DIV. 16	ELECTRICAL

1.03 STANDARDS:

In accordance with 01-080 CODES AND STANDARDS and the following:

ADA	Americans with Disabilities Act
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers

1.04 ACCEPTABLE MANUFACTURERS:

- A. GARAVENTA LIFT, as supplied by "Garaventa Lift Corp.," (800) 663-6556 or approved equivalent.
1. Products from the following manufacturers are approved equivalent subject to the requirements of the specification and the drawings: THE CHENEY COMPANY, INC. as supplied by "Access Elevator of Burbank, Ca".

1.05 SUBMITTALS:

- A. Shop Drawings: In accordance with Section 01-300 SUBMITTALS
1. Manufacturers with different platform sizes shall submit to the Architect their layout indicating the different dimensions for review and acceptance by the Architect prior to fabrication of the Lift.
 2. Manufacturers with different voltage requirements than that specified or shown on the drawings shall submit to the Architect their layout indicating the different voltage requirements for review and acceptance by the Architect prior to fabrication of the Lift. Step-up or step-down transformers necessary for compatible utility hook-ups remain the responsibility of the Lift Contractor for proper interface with the building's design power requirements.
- B. Product Data: In accordance with Section 01-300 SUBMITTALS

- C. Permits and Inspections: In accordance with Section 01-300 SUBMITTALS.
 - 1. Lift Contractor shall obtain and furnish all licenses and permits and shall arrange for and make all inspections and tests required.
- D. Maintenance Manuals: In accordance with Section 01-300 SUBMITTALS. Provide bound manuals for each different type lift, with operating and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information.
- E. Warranty: In accordance with Section 01-300 SUBMITTALS and 01-740 WARRANTIES.

1.06 QUALITY ASSURANCE:

- A. **DEFINITIONS:** All terms in this specification shall have the meaning defined in the latest approved Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A18.1, including all revisions and authorized changes to date.
- B. **Qualifications of Manufacturer:** A company with not less than ten (10) years of experience in the design and fabrication of vertical platform lifts.
- C. **Qualification of Lift Contractor:** Lift Contractor shall be a Contractor duly licensed by the State of California, and shall have a minimum of five (5) years experience installing and maintaining Wheelchair Lift equipment.

1.07 MAINTENANCE:

- A. The Contractor shall maintain a regular service facility in the area in which the Wheelchair Lift is located and shall furnish semi-annual maintenance service on each Wheelchair Lift completed under this contract for a period of twelve months after completion. All work shall be done during regular working hours of regular working days. The work shall include regular examinations by trained employees and shall include all necessary adjustments, greasing, oiling and parts to keep the Wheelchair Lift equipment in operation, except parts made necessary by misuse, accidents, or negligence by parties other than the Wheelchair Lift Contractor.

1.08 WARRANTY:

- A. Lift shall have a two (2) year unlimited warranty on the entire Lift System.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS:

- A. General: Provide manufacturer's standard pre-engineered lift system (complete operational system) that complies with the California State Elevator Governing Agency and ADA requirements. Provide manufacturer's products as specified for a complete lift system.
 - 1. Base unit specified herein is GENESIS OPAL, GVL-42 with 90 degree configuration Platform Lift with Hydraulic Drive" with Unassisted Entry, self-rechargeable battery power backup, shown on the drawings and shall be platform lift of all steel bolted and/or welded construction, with the entire assembly UL Approved & CBC Compliant for indoor/outdoor use, as manufactured by GARAVENTA LIFT CORP., or approved equivalent.

- B. Systems and Machinery: Provide lift system to comply with the following requirements:
1. **Rated Capacity:**.....750 lbs.
 2. **Rated Speed:**.....17 feet per minute minimum.
 3. **Power Supply:**..... single phase, 2.2 KW
 4. **System Control Voltage:**.....24 VDC
 5. **Self Supporting Structure:** Provide units with structural steel self-supporting framing that requires vertical-load support only at base and lateral support only at landing levels.
 6. **Inserts:** Provide required concrete inserts and similar anchorage devices required for the installation of structural members, guide rails, machines, and other components.
 7. **Platform Minimum Size:**44” x 59” minimum
- C. Control System: Provide remote switch at each control station that will permit “up” and “down” buttons. Controls to comply with the CBC, requirements of ANSI A 117.1 and ASME/ANSI A 17.1, and the ADA.
1. Provide solid-state control system to greatest extent of availability, supplemented with electromechanical equipment.
 2. Leveling Tolerance: Provide terminal stopping system at each extreme of travel and adjust to maintain level tolerance within 1/2 inch regardless of load size or direction of travel.
 3. Limit Switches: Provide at both top and bottom extremes of travel.
 4. Obstruction Sensors: Provide sensors to cut power and stop unit in the event of contact with foreign object within pathway of travel. Comply with ASME/ANSI A 17.1.
 5. Safety Device: Provide safety device to stop platform in event of overspeed condition or of breakage or slackening of suspension of support means.
 6. Manual Lowering: Provide means to manually lower platform in case of malfunction or power loss.
- D. Accessories:
1. **AUTOMATIC OPERATING GATES:** Provide gates on the platform lift itself, and gates at the top and bottom of the hoistway. All gates and guard rails shall be 42 inches high, self-closing and equipped with both mechanical and electrical contacts which will prevent operation of the platform unless all gates are properly closed.
 2. **CALL-SEND CONTROLS:** Provide Surface Mounted “Call-Send” controls for the top and bottom landings. These controls make it possible to “Call” the unit’s platform to the top or bottom landing in an event another person needs to use the unit.
 3. **EMERGENCY STOP AND AUDIBLE ALARM:** Provide manufacturer’s standard Emergency Stop and Audible Alarm feature with Battery Back-up.
 4. **GRAB RAIL:** Provide manufacturer’s standard Stainless Steel Grab Rail on the inside of platform side guard.
 5. **REMOTE ALARM:** Provide remote alarm located at campus office.
 6. **ADA PHONE:** Connect to bldg. telephone system.
- E. Wiring:
1. Provide all wiring for the proper operation of the equipment.
 2. All ducts or conduits in the lift hoistway hatch or in the floors shall be installed in an orderly manner.
 3. Trail cables shall be of the best grade for the service. They shall be hung so that the proper size loop may be obtained, and shall have a fire resistant outer braid which shall meet the Underwriter’s Standard Test.
- F. Materials and Finishes: Comply with the following:
1. Enameled Steel: Provide formed steel units with manufacturer’s standard baked synthetic enamel finish; colors as selected by the Architect from the manufacturer’s full color range (minimum of 6 colors to select from).

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Prior to installation of Wheelchair Lift, inspect the installed Work executed under other Sections which affect the installation of the Wheelchair Lift.
- B. Report unacceptable conditions to Architect. Do not begin work until unacceptable conditions have been corrected.
- C. Installation of Wheelchair Lift shall constitute acceptance of existing conditions.

3.02 COORDINATION:

Coordinate Work with related items specified under other Sections to ensure proper and adequate interface of Work.

3.03 INSTALLATION OF WHEELCHAIR LIFT:

- A. Install in accordance with details on drawings, and manufacturer's current specification.
 - 1. Position sills accurately with floors or counters, raised slightly above adjoining surface to minimize intrusion of dirt and spillage into runway. Coordinate with other trades to ensure that sills, or lower member of frames, are solidly grouted (no voids) with a non-staining, non-shrinking grout.
 - 2. Adjust stops for accurate leveling at each landing, within specified tolerances.
 - 3. Lubricate operating parts of lift, including drive mechanism, guide rails, gates, safety devices, and hardware.
- B. The entire wiring system shall be tested for insulation to ground.
- C. All exposed metal work furnished under these specifications except as otherwise specified, shall be properly painted by the Wheelchair Lift contractor.

END OF SECTION

SECTION 21 00 00 - FIRE SPRINKLER SYSTEM

PART 1 - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS:

- A. The General Mechanical Provisions, Section 23 00 00, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

- A. General: 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 entire building shall be fire sprinklered.
- B. Design/Calculations: The sprinkler system has been designed and sized by hydraulic calculations in accordance with 2022 NFPA No. 13 and fire authority requirements. Calculations have been included in submittals. Provide current fire flow information from flow test at nearest fire hydrant. Fire flow test shall be done within 6 months of installation of sprinkler system.
- C. Preparation of Drawings and Material Data Sheets: A complete fire sprinkler submittal (drawings, specifications, materials and hydraulic calculations) has been prepared. Hydraulic calculations shall conform to 2022 NFPA 13, paragraph 28.4.5 in all respects.
- D. Coordination Drawings: Contractor shall submit coordination drawings with Contractor title block to Engineer for review, in addition to materials submittals. Deviations between bid documents and coordination drawings shall be specifically noted on drawings (highlighted, clouded, etc.). Any contractor requested design changes to these documents, including layout, materials, or calculations, may be considered a substitution and shall comply with paragraph 1.4 below.

1.3 WORK SPECIFIED ELSEWHERE:

- A. Electrical wiring.
- B. Fire alarm system.
- C. Painting of exposed piping.

1.4 DESIGN CHANGES/SUBSTITUTIONS:

- A. General: Design changes or substitutions of fire sprinkler system shall be submitted to Engineer for review.
- B. Significant changes in design or substitution of materials may require a change order, requiring resubmission to DSA/FLS, as determined by the Engineer and/or DSA field engineer. Contractor shall bear all expenses incurred due to preparation and processing of design substitutions, up to and including submission to, and obtaining approval from, DSA/FLS. Refer to Section 23 00 00, 1.11, B, and DSA Policy PL 10-01 and Interpretation of Regulations IR A-6, available from <http://www.dsa.dgs.ca.gov>.
- C. Any substitution of "Flexible" type piping in lieu of "Rigid" pipe or any changes to size, manufacturer or lengths of "Flexible" type piping will require resubmittal of piping plans, product data sheets and hydraulic calculations to DSA/FLS for review and approval.
- D. Contractor shall submit design or field change(s) through proper channels. Engineer shall have a minimum of 5 working days after receipt of design or field change(s) to submit to DSA. Architect and Engineer shall not be liable for any delays due to DSA review time scheduling, or

Contractor's failure to identify changed areas and/or substituted materials in shop drawings and submittals.

PART 2 - PRODUCTS

2.1 STANDARDS:

- A. All materials shall be in accordance with 2022 NFPA No.13 "Standard for the Installation of Sprinkler Systems". Underground mains shall be in accordance with 2019 NFPA No. 24 "Standard for the Installation of Private Fire Service Mains and Their Appurtenances".

2.2 PIPING MATERIALS:

- A. General: The pressure rating of all piping, valves, flanges and other piping accessories shall be in accordance with code and fire authority requirements. Pressure ratings shall exceed the highest possible working pressure.
- B. Piping:
 - 1. Underground: Polyvinyl chloride, AWWA C900, DR 14, FM Class 200 with rubber ring joints, ASTM D1869. Cast or ductile iron fittings, AWWA C110 or C153, Class 250 or higher, with rubber ring joints, ASTM D1869.
 - 2. Above Grade:
 - a. 2" and Smaller: Threaded black steel pipe, ASTM A53, schedule 40. 175 psi WOG (min.) black cast iron threaded fittings, ANSI B16.4, UL listed. Unions shall be Class 150 malleable iron threaded, ANSI B16.3.
 - b. 2-1/2" and Larger: Welded or grooved black steel pipe, ASTM A53, schedule 10. Standard weight carbon steel welding fittings, ANSI B16.9. Flanges shall be steel, ANSI B16.5. Roll grooved pipe couplings may be used for assembling welded sections, Victaulic, Grinnell, Gruvlok.
- C. Gate Valve:
 - 1. 2" and Smaller: All bronze, rising stem. UL listed.
 - 2. 2-1/2" and Larger: Iron body, bronze mounted, outside screw and yoke. UL listed. (UL listed butterfly valves may be substituted for 4" and larger gate valves above grade.)
- D. Check Valve:
 - 1. 2" and Smaller: All bronze swing check. UL listed.
 - 2. 2-1/2" and Larger: Iron body, bronze mounted swing check. UL listed.
- E. Drain Valve: All bronze angle globe valve. UL listed.
- F. Anchors and Hangers: Shall comply with 2022 NFPA No. 13.

2.3 SPRINKLER HEAD:

- A. Automatic sprinkler head, semi-recessed in areas with finished ceilings, upright or pendent heads elsewhere (as allowed by NFPA 13). Heads in finished areas shall be Victaulic FireLock V27 or V34 quick response (unless noted otherwise on drawings), Tyco, Model TY-FRB or Globe Fire Sprinkler Corp., Model GL Quick Response, with standard finish. UL listed. Temperature ratings shall be in accordance with NFPA No. 13. Provide extra heads (of each type installed) in accordance with code requirements. Exposed heads installed with deflector lower than 7'-6" above floor shall have wire guards.

2.4 ALARM VALVE ASSEMBLY:

- A. Standard wet type alarm valve assembly complete with trim as required by the authority having jurisdiction. Provide flow switch and Electric Bell for connection to alarm system. Provide tamper switch. UL listed. Coordinate Electric Bell with Divisions 26 and 28.

2.5 POST INDICATOR VALVE:

- A. UL listed valve with lockable operating handle, tamper switch and target visible through a glass covered post, reading either "OPEN" or "SHUT".

PART 3 - EXECUTION

3.1 PIPING INSTALLATION:

- A. General: Piping shall be concealed in walls, above the ceilings or below grade unless otherwise noted. Exposed piping 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, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. Depth of cover in traffic areas shall be 36 inches (minimum).
- B. Standards: All piping shall be installed in accordance with NFPA No. 13 "Standard for the Installation of Sprinkler Systems". Underground mains shall be installed in accordance with NFPA No. 24 "Standard for the Installation of Private Fire Service Mains and Their Appurtenances".
- C. Miscellaneous:
 - 1. Escutcheons: Provide chrome plated metal escutcheons where piping penetrates walls, ceilings or floors in finished areas.
 - 2. Pattern: Sprinklers shall be installed in a symmetrical pattern with lighting fixtures and with ceiling pattern. Heads located in lay-in ceilings shall be centered in panel, unless shown otherwise on drawings.
 - 3. 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 and 2" annular clearance for piping 4" and larger.
 - 4. Access: Provide access doors as required for all valves, devices, etc.
 - 5. 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.
 - 6. 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.
 - 7. Electrical Equipment: Piping shall not be run over electrical panels, motor control centers or switchboards, except where specifically allowed by CEC.

3.2 IDENTIFICATION:

- A. All controls, piping, valves and equipment shall be labeled for function and service in accordance with NFPA No. 13 and No. 24.

3.3 TESTS AND ADJUSTMENTS:

- A. Unless otherwise directed, tests shall be witnessed by a representative of the Architect and an inspector of the authority having jurisdiction. Contractor shall notify fire authority at least 48 hours prior to testing. At various stages and upon completion, the system must be tested in the presence of the enforcing agency. 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 the entire work retested. Test all systems in accordance with fire authority requirements and NFPA No. 13 and No. 24.

- B. 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.

3.4 CERTIFICATION:

- A. At completion of the project, a Contractor's Material and Test Certificate, indicating installation and testing in accordance with referenced standards, shall be completed. Copies shall be prepared by Contractor for the approving authorities, Owner and Contractor. Deliver certificates to Owner through Architect.

END OF SECTION

SECTION 22 00 00 - PLUMBING

PART 1: - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS:

- A. The General Mechanical Provisions, Section 23 00 00, 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. Storm drain system.
 4. Fuel gas system.
 5. Drain system (including condensate drain).
 6. All equipment as shown or noted on the drawings or as specified.
 7. Demolition as indicated on drawings. Where demolition is called for, remove all equipment, piping, braces, housekeeping pads, supports and related items no longer required.
 8. 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.
 5. Control of circulating pumps, etc.

PART 2: - PRODUCTS

2.1 PIPING MATERIALS:

- A. Sanitary Sewer:
1. Soil, Waste and Vent Piping (Non-Pressurized):
Inside Building Above Grade: 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.
Inside Building Below Grade, All Grease Waste and Within Five Feet of Building Walls: Standard weight epoxy-coated cast iron pipe and fittings. Plain end, CISPI 301, ASTM A888. The inside of each pipe shall be reamed prior to coating to decrease the coefficient of friction. Pipe coating shall be chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and finally an electrically deposited, high performance anodic epoxy top coat. Pipe and fitting coatings must pass the following performance specifications per EN 877: 350 hours of salt spray testing, resistance to wastewater for 30 days at 73° F, chemical resistance from pH 2 to pH

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12 for 30 days at 73° F, resistance to hot water for 24 hours at 203° F. Cutting of piping and field coating of all cut joints shall be in accordance with the manufacturer's installation guidelines. Couplings shall be heavy-duty shielded couplings, Type 304 stainless steel, with neoprene gasket, ASTM C1540. Husky HD 2000. Charlotte Edge HP Iron.

Outside Building Below Grade: Polyvinyl chloride (PVC), SDR 35, ASTM D3034 with PVC fittings with rubber ring joints. Piping within 10 feet of water piping shall be solid wall Schedule 40 PVC, ASTM D1785, D2665, with solvent weld DWV fittings, ASTM D2665, D3311. Piping with less than 24" of cover outside building walls shall be cast iron.

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. Storm Drain (Including Rain Water Leader, RWL) - Inside Building and Within Five Feet of Building Walls: Same as Soil, Waste and Vent Piping, except as otherwise noted on drawings. Where exposed to view on exterior of building, piping shall be galvanized steel with recessed drainage fittings.

C. Water and Gas:

1. Hot and 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) Schedule 40 galvanized steel pipe, ASTM A53. 150 psi galvanized malleable iron screwed fittings, ANSI B16.3. Galvanized steel below grade shall have protective coating.
 - or- (2) 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 solder. All nipples shall be lead-free red brass (85% copper). Branch piping from the cold water main above the ceiling to roof mounted hose bibbs shall be type "K" copper. Above grade fittings may be copper 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 D2466 where approved by administrative authority.
2. Gas Piping:
 - a. Inside Building and All Above Grade: 2" and Smaller: Schedule 40 galvanized steel pipe, ASTM A53. 150 psi galvanized malleable iron screwed fittings, ANSI B16.3, ANSI B31.8. Flexible connections shall be corrugated stainless steel, CSA (US) approved. 2-1/2" through 4": May be screwed pipe as above or welded pipe as below. Welded: Schedule 40 black steel pipe, ASTM A53. Standard weight carbon steel welding fittings, long radius ells, ANSI B16.9.
 - b. Inside Building - Below Grade to Five Feet Outside Building: Same as Inside Building and All Above Grade. Provide sleeves (and vents as required by code) acceptable to administrative authority.
 - c. Outside Building - Below Grade: Polyethylene pipe and fittings, ANSI B31.8, ASTM D2513, where allowed by administrative authority, Driscopipe 6500, Dupont Aldyl "A", Plexco. Otherwise, piping shall be coated schedule 40 steel, ASTM A53.
3. Valves and Specialties:

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- 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.
 - (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.
 - (3) Check Valve: 2" and Smaller: Lead-free bronze swing check, regrinding. 200 psi CWP. Nibco T-413-Y-LF. For vertical applications use lead-free bronze, spring-loaded, lift-type. Nibco T-480-Y-LF. Check valves for air systems shall be the spring-loaded, quick-closing type, Stockham B-322-TS.
 - (4) 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.
 - (5) Plug Valve: Valves in gas piping systems must be UL or CSA listed for gas distribution. 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.
 - (6) 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. Instruments:
- (1) Thermometer: 3" dial. Stainless steel case. Back or bottom connected as required. 1/2" NPT. 20F-240F, 2F divisions for hot water. 25F-125F, 2F divisions for chilled water. 2" insertion length. Allowance to be made for insulation thickness. For installations over 7 feet above finish floor, provide digital thermometer with remote reader. Marshalltown, Moeller, Taylor, Tel Tru, Winters.
 - (2) Thermometer Well: Brass well. Suitable for thermometer above. Provide 2" extension at insulated pipes.
- c. Miscellaneous Specialties:
- (1) Temperature and Pressure Relief Valve: ASME rated fully automatic, reseating combination temperature and pressure relief valve sized in accordance with energy input. Sensing element immersed within upper 6" of tank. Watts.
 - (2) 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, Grevlok.
 - (3) Dielectric Coupling: Insulating union or flange rated for 250 psig. Wilkins DUXL Series.
 - (4) Shock Absorber: Multiple bellows. All stainless-steel construction. Designed and applied in accordance with PDI WH201. Amtrol, Smith, Wade, Zurn.
 - (5) Flexible Connection: Corrugated bronze or stainless-steel core covered with high tensile bronze or stainless-steel tubular braid. 150 psi working pressure. NSF 61 and 372 listed. 2" and smaller shall have screwed connections. 2-1/2" and larger shall have flanged connections. Flexonics, Keflex, Metraflex.
 - (6) Gas Pressure Reducing Valve: Capacity and pressure ratings as indicated on drawings. American Meter.

D. Drain Piping (including Condensate): Same as inside building cold water piping.

1. Condensate Drain Piping for Condensing Gas Fired Equipment: Solid wall schedule 40 CPVC piping with solvent weld fittings from equipment to neutralizing kit. Schedule 40 galvanized steel, ASTM A53 downstream of neutralizing kit. If no neutralizing kit, piping shall be CPVC to point of discharge.
- E. Flue and Intake Piping (Condensing Gas Fired Equipment): Schedule 40 CPVC piping with Schedule 40 CPVC solvent weld fittings. Install per equipment manufacturer's instructions.
- F. 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/ft² 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. Stretchable Glass Fabric: Reinforcing mesh. 10 X 20 continuous filament glass yarns per inch. Johns-Manville.
- F. Vapor Barrier Coating: Childers CP-30, Foster 30-25.
- G. Lagging Adhesive: Childers CP-50A, Foster 30-36.
- H. 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.
- I. Outdoor Mastic: Childers CP-10, Foster 65-05.

- J. 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.
- K. Molded Closed Cell Vinyl (Piping Insulation Under Lavatories and Sinks): Fully molded closed cell vinyl, 1/8" thick, minimum. Thermal conductivity shall not exceed 1.17 BTU-in/hr-ft²-°F at an average temperature of 73°F. Weep hole in cleanout nut enclosure. Hinged cap over valve to allow access for servicing. Out of sight nylon fastening system and internal ribs on drain insulation to provide air gap (Lav-Guard Only). Truebro Lav-guard, McGuire Pro Wrap, Plumberex.

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, 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:
 - a. Gas: Gas burning equipment shall be furnished with 100% safety gas shut-off, intermittent pilot ignition, and shall be CSA (US) or AGA certified.
 - b. 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. 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, 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 from 1 horsepower to 5 horsepower shall be the standard high efficiency type, Magnetek E-Plus. Motors 7-1/2 horsepower and larger shall be the premium efficiency type, tested according to IEEE Standard 112, Method B. Motors exposed to weather shall be TEFC. Vertical motors with exposed fans 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.
- B. Water Heater: Natural Gas Fired. Minimum 92% thermal efficiency. Shall be design certified by CSA for 180°F application. Tank shall be lined with Vitraglas® vitreous enamel and shall have a bolted hand hole cleanout. Tank shall have four extruded magnesium anode rods installed in separate head couplings. Water heater shall be equipped with stainless steel cold water inlet, Hydrojet® Sediment Reduction System. Heater shall be insulated with Non-CFC foam. Water heater shall be equipped with an electronic ignition system, an ASME rated T&P relief valve and a premix closed combustion system for direct venting using either 3" or 4" CPVC vent pipe. Factory assembled and tested. Water heater shall be approved for zero inch clearance to combustibles. A digital LCD display shall be integrated into the front and be an adjustable electronic thermostat to any temperature up to 180°F. A recycling Energy Cut Off (E.C.O.) shuts off all gas in the event of an overheat condition. Certified at 300 PSI test pressure and 150 PSI working pressure. Design certified by CSA International, ANSI standard Z-21.10.3, for up to 180°F application as an Automatic Storage Heater. Neutralizing kit. Bradford White.
- C. Water Heater: Electric. Glass lined tank with magnesium anode protection. 150 psi working pressure. Fully insulated. Automatic temperature control. High limit control. Provide ASME rated temperature and pressure relief valve sized in accordance with energy input, dielectric couplings and drain cock. UL listed. A.O. Smith, American Appliance, State Industries.
- D. Circulating Pump: In-line centrifugal. 3-speed motor. Body: Lead Free bronze body, brass impeller. Mechanical seals. Bronze sleeve bearings. Integral thermal overload protection. Bell and Gossett/Xylem, Taco. -OR- Body: Aluminum housing. All parts exposed to fluid, stainless steel. Water lubricated ceramic shaft and bearings. Epoxy encapsulated windings. Grundfos.

2.5 GREASE INTERCEPTOR:

- A. Precast reinforced concrete grease interceptor designed and constructed in accordance with California Code of Regulations, Title 24. 24" manholes with gas tight cast iron ring and bolted cover.

See schedule on drawings for tank sizing, inlet and outlet sizing and number of manholes. Jensen Precast, M.C. Nottingham, Pro-Cast.

2.6 PIPING FREEZE PROTECTION TAPE:

- A. General: The self-regulating heating cable shall consist of two (2) 16 AWG nickel-copper bus wires embedded in parallel in a self-regulating polymer core that varies its power output to respond to temperature all along its length, allowing the heating cable to be cut to length in the field. The heating cable shall be covered by a radiation-crosslinked, modified polyolefin dielectric jacket. To provide a ground path and to enhance the heating cable's ruggedness, the heating cable shall have a braid of tinned copper and an outer jacket of modified polyolefin. Power connection, end seal, splice, and tee kit components shall be applied in the field. Heating cable circuit shall be protected by a ground-fault device for equipment protection. Raychem XL-Trace, or equal.
- B. The heating cable shall have a self-regulating factor of at least 90 percent. The self-regulation factor is defined as the percentage reduction, without thermostatic control, of the heating cable output going from 40°F pipe temperature operation to 150°F pipe temperature operation. The heating cable shall operate on line voltages of 120 volts without the use of transformers.

The heating cable for metal-pipe freeze protection shall be sized according to the table below. The required heating cable output rating is in watts per foot at 50°F. (Heating cable selection based on 1 inch fiberglass insulation on metal piping.)

Minimum Pipe Size (inches)	Ambient Temperature	
	0°F	-20°F
3 or less	5 watts	5 watts
4	5 watts	8 watts
6	8 watts	8 watts
8	8 watts	2 strips-5 watts
10	2 strips-5 watts	2 strips-8 watts

- C. All heating-cable components shall be UL Listed, CSA Certified, or FM Approved for use as part of the system to provide pipe freeze protection. Component enclosures shall be rated NEMA 4X to prevent water ingress and corrosion. Installation shall not require the installing contractor to cut into the heating-cable core to expose the bus wires. Connection systems that require the installing contractor to strip the bus wires or that use crimps or terminal blocks, shall not be acceptable. All components that make an electrical connection shall be reenterable for servicing. No component shall use silicone to seal the electrical connections. An exception will be made in areas where a conduit transition is required.
- D. Thermostatic Control-Line Sensing: The system shall be controlled by a line sensing thermostat, (EC-TS) set at 40°F.

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 1100F. Brazing shall be performed by a Certified Brazier 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, except that gas valves within 18" of the point of connection to the equipment may be the same size as the equipment connection.
 - 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. For situations where this is not practical or where valves are greater than 10' above the floor, chain wheel operators shall be provided. Chain shall extend down to 7' above the floor. All such installations must have prior review by the Engineer.
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	Plastic
1/2	6	6	4
3/4	6	8	4
1	6	8	4
1-1/4	6	10	4
1-1/2	6	10	4
2	10	10	4
2-1/2	10	10	4
3	10	10	4
4	10	10	4

*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. Hot and Cold Water Piping: All hot and 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. Piping through walls or footings below grade shall be sealed with Link Seal.
 - 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. Thermometer Tap: Provide tee for instrument well. Minimum size of pipe surrounding well shall be 1-1/2". Mount on side of pipe.
- 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. Storm Drain (Including Rain Water Leader, RWL): Similar to Sanitary Sewer. Piping with less than 24" of cover outside building walls shall be cast iron.
- D. 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.
- E. Gas Piping: Installation shall comply with CPC and NFPA 54 (National Fuel Gas Code). Shall be pitched to drain to drip legs at low points where other than dry gas conditions exist. No unions shall be installed except at connections to equipment. Provide shutoff and dirt leg (sediment trap) at each equipment connection. Only equipment mounted on vibration isolators shall be connected with

flexible connectors. Under floor piping shall be sleeved (and vented as required by code). Plastic pipe and fittings shall be joined in accordance with manufacturer's recommendations. Metal to plastic transition fittings shall be installed at all transitions. Provide 14-gage insulated tracer wire secured to pipe at 10' intervals with nylon ties. Terminate tracer 6" above grade at both ends.

Odor Fade Warning – The odorant in propane (LP) and natural gas is colorless and the intensity of its odor can fade under some circumstances. Contact the utility company for more information.

Submit installer training certification from polyethylene piping manufacturer certified trainer, include copy of trainer's certification. Training shall have been completed no more than 6 months prior to starting work.

- F. 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.
- G. 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. Domestic Hot Water:
 - 1. General: All domestic hot water piping, fittings and accessories shall be insulated.
 - 2. Pipe: Apply pre-molded fiberglass sections to pipe using integral pressure sealing lap adhesive in accordance with manufacturer's recommendations. Stagger longitudinal joints. Seal butt joints with factory supplied pressure sealing tape.
 - 3. Fittings and Valves:
 - a. Wrap all fittings and valves with pre-cut fiberglass blanket to thickness matching adjoining insulation. Cover blanket with PVC jacket in accordance with manufacturer's recommendations. Solvent weld. Seal all joints with factory supplied pressure sealing vapor barrier tape with 1-1/2" (min.) overlap on both sides of joint. Insulate valves to stem. Do not insulate unions, flanges or valves unless water temperature exceeds 140F or the piping is exposed to weather.
 - b. For miscellaneous fittings and accessories for which PVC jackets are not available or where proximity of fittings precludes a neat-appearing installation, the Contractor may cover the fiberglass blanket with stretchable glass fabric, one coat of lagging adhesive and a final coat of vapor barrier coating. All exposed ends of insulation shall be adequately sealed.
 - 4. Additional Finish for Exposed Piping and Equipment: All piping and equipment exposed to view but protected from the weather shall be given an additional finish of PVC jackets.
- B. 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 same as hot water piping. 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.
- C. Piping Insulation Under Lavatories and Sinks: Exposed water piping, water stops and drain piping under lavatories and sinks shall be insulated with 1/8" thick molded closed cell vinyl. Installation shall be in accordance with manufacturer's instructions.

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 INSTALLATION OF FREEZE PROTECTION TAPE:

- A. System shall be installed on the Condensate Drain piping inside the Walk-in Refrigerator and Freezer boxes. Installation shall be per manufacturer's recommendations. Apply the heating cable linearly on the pipe after piping has been successfully leak tested. Secure the heating cable to piping with cable ties or fiberglass tape. Apply "Electric Traced" labels to the outside of the thermal insulation. After installation and before and after installing the thermal insulation, subject heating cable to testing using a 2500-Vdc Megger, Minimum insulation resistance shall be 20 megohms or greater.
- B. Insulate piping with 1" thick fiberglass, similar to 3-02A above, except provide complete vapor barrier. Seal all joints and seams with vapor barrier coating in addition to the vapor barrier tape. Cover insulation with Aluminum Jacketing, seal water tight with metal jacketing/flashing sealant.

3.6 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.
 - 3. Storm Drain: 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 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.
4. Gas Piping: Maintain 100 psig air pressure for 4 hours.

3.7 DISINFECTION:

- A. Disinfect all domestic water piping 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 witnessed by a representative of the Architect. During procedure signs shall be posted at each water outlet stating, "Chlorination - Do Not Drink". After disinfection, one set of water samples shall be collected by Contractor for bacteriological analysis in presence of Inspector. 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. Bacteriological testing results shall be obtained by Contractor and delivered to the Owner through the Architect before project completion. Contractor shall include copy of Bacteriological Test Results at closeout with operation and maintenance manuals.

END OF SECTION

SECTION 23 00 00 - GENERAL MECHANICAL PROVISIONS

PART 1: - GENERAL

1.1 GENERAL CONDITIONS:

- A. The preceding General and Special Conditions and Divisions 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. American Gas Association - AGA
 9. Air Movement and Control Association - AMCA
 10. American National Standards Institute - ANSI
 11. Air Conditioning and Refrigeration Institute - ARI
 12. American Society of Heating, Refrigerating, and Air Conditioning Engineers - ASHRAE
 13. American Society of Mechanical Engineers - ASME
 14. American Society for Testing and Materials - ASTM
 15. American Water Works Association - AWWA
 16. Cast Iron Soil Pipe Institute - CISPI
 17. National Electrical Manufacturers Association - NEMA
 18. National Fire Protection Association - NFPA
 19. National Sanitation Foundation - NSF
 20. Occupational Safety and Health Act - OSHA
 21. Plumbing and Drainage Institute - PDI
 22. Sheet Metal and Air Conditioning Contractors National Association - SMACNA
 23. 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. All charges are to be included in the work. Permits for equipment connected to a particular system are to be considered as part of the work included under each system. All charges or fees for service connections, meters, etc. 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,

pipng, 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.

- B. **Mandatory Coordination and Shop Drawings:**
1. Prepare or have prepared high level detailed Shop Drawings in plan view, with cross-sections as necessary, indicating the proposed installation plan for all HVAC, mechanical, fire sprinkler, and plumbing installations for the project. These Drawings should depict actual elevations and linear dimensions, as well as all routing changes, transitions, major offsets, deck and structural attachments deemed necessary to accomplish the installation. Individual Shop Drawings may be prepared for each trade working within the designated space or area; however, the coordination of the consolidated installation shall remain the responsibility of the Contractor. These Shop Drawings shall be provided to each Subcontractor having Work in each area for coordination. Any fittings, offsets or other changes due to coordination shall be at no additional cost to Owner.
 2. Whereas the Drawings are diagrammatic, showing only the general arrangement of the systems, Contractor shall have responsibility for the fitting of materials and equipment to other parts of the equipment and structure, and to make adjustments as necessary or required to resolve space problems, preserve service room, and avoid architectural and structural elements and the Work of other trades. Contractor may be required to identify certain areas to relocate installations within the spaces depicted on the Drawings, e.g., ductwork and/or piping may be shifted within the space shown to accommodate other systems. Such functional relocations shall not be deemed a change to the requirements of the Contract. In the event a major re-routing of a system appears necessary, Contractor shall prepare and submit for approval, Shop Drawings of the proposed rearrangement.
 3. Because of the diagrammatic nature and small scale of the Drawings, all necessary offsets, adjustments, and transitions required for the complete installation are not shown. Contractor shall carefully investigate the conditions affecting all the Work and shall arrange such Work accordingly, furnishing such fittings, equipment, valves, accessories, offsets, etc., as may be required, regardless of size or cost, to meet such conditions, at no additional cost to the Owner.
 4. Coordination changes are not design changes and shall be provided at no additional cost to Owner. Any guidance, drawing or clarification issued by the Architect or Engineer to assist the Contractor or their sub-contractors in their coordination during construction are not design changes and shall be provided at no additional cost to Owner.
 5. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of work between sections. The Contractor's decisions, if consistent with the Contract Documents, shall be final. The Architect and their Consultants are not required to coordinate work between sections and will not do so. Any changes required that affect the design intent shall be presented to and approved by the Architect and Engineer of Record.
 6. The coordinated Shop Drawings must be signed off by HVAC, Plumbing, Fire Sprinkler, Electrical, Framing, Ceiling Installation, and Data and Low Voltage Subcontractors.
 7. The signed off Shop Drawings shall be submitted to the Owner's Representative for review and approval prior to commencement of installation.
 8. Provide reviewed Shop Drawings to each Subcontractor having Work in each area.

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 (this includes deferred approval items). 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. Drawings shall be submitted in both hard copy and electronic form, electronic files shall be in their native format (i.e. DWG for AutoCAD, RVT for Revit, etc).
 5. 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. Native soil may be used where allowed by Geotechnical (Soils) Report. Where native soil is used, trenching for gravity drain pipe shall be done using a laser-level and trencher.
 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"
Fire/smoke damper, VAV box, coil	20" x 24"

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 1617A.1. All equipment mounted on concrete shall be secured with a concrete anchor as specified above at each mounting point. All air handlers shall be mounted on spring isolators. Secure base plate as indicated above.

1.20 SEISMIC SUPPORT AND RESTRAINT DESIGN SERVICE:

- A. All mechanical systems (equipment, ductwork, piping, etc.) shall be provided with supports and seismic restraints in accordance with the "Seismic Restraint Components for Suspended Utilities", 8th Edition, as published by Mason West Inc., OPM-0043-13, or other HCAI pre-approved system, and in accordance with ASCE 07-16, Chapter 13, as amended by CBC Section 1617A.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.
- B. Contractor shall obtain the services of a Seismic Design service to provide engineered seismic supports and restraints for the project. Mason Industries, or pre-approved equal. **Note: Use of the "12 inch rule" does not exempt Contractor from this requirement.**
1. All seismic designs, including designs using HCAI pre-approvals, shall be submitted as project specific engineered designs sealed and signed by a licensed California structural engineer. All seismic designs shall include project / application specific seismic design demand calculations. Said seismic design demand calculations shall account for seismic forces in all applicable direction including axial, lateral, vertical tension, vertical compression, etc. Designs shall account for prying, eccentricity, uneven loading, weak axis bending, etc.
 2. Seismic restraint layouts for piping, ductwork and electrical raceways shall be furnished on shop drawings or added to the contractor's shop drawings and shall include:
 - a. The number, size and location of seismic braces.
 - b. Maximum support loads and seismic loads at the seismic brace locations.
 - c. Reference to specific details or pages from the HCAI pre-approved system (OPM).
 - d. **If use of the "12 inch rule" is intended by Contractor, design service shall verify locations where it is intended to be used is feasible and specifically identify these locations on the shop drawings, along with appropriate hanger details.**
 3. Installations not addressed by the OPM approval must be designed, detailed and submitted along with the shop drawings.
 4. Submit seismic restraint layout drawings and special details for approval of the project structural engineer per the requirements listed in the HCAI pre-approval (OPM).
 5. Seismic restraint layout drawings shall bear the stamp and signature of the registered professional structural engineer licensed in the state of California who designed the layout of the braces.

1.21 ASBESTOS CONTAINING MATERIALS AND ASBESTOS REMOVAL:

- A. No materials or material coatings containing asbestos shall be allowed on this project.
- B. All asbestos removal shall be by Owner. Asbestos is to be removed before the work is started. If the Contractor discovers asbestos which has not been removed, the Contractor shall immediately cease work in that area and promptly notify the Owner.

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. As part of the Contractor's overhead expense, request a full set of reproducible drawings to 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

SECTION 23 00 01 - HEATING, VENTILATING AND AIR CONDITIONING

PART 1: - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS:

- A. The General Mechanical Provisions, Section 23 00 00, 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. Circulating water system.
 4. Refrigeration system.
 5. System energy balance.
 6. Coordinate with Section 23 09 23 (Direct Digital Control and Energy Management System) regarding location and installation of system sensors and to provide simultaneous start-up.
 7. 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, motor starters in motor control centers, disconnect switches and installation of all starters are included in the Electrical Section, unless otherwise noted.
 2. Connection of water, gas and 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.
 6. Direct Digital Control and Energy Management System (DDC/EMS).

PART 2: - PRODUCTS

2.1 PIPING MATERIALS:

- A. Chilled/Hot Water Piping:
1. Above Grade:
 - a. 2" and Smaller: Schedule 40 black steel pipe, ASTM A53. 150 psi black malleable iron screwed fittings, ANSI B16.3. Piping at floor mounted unit ventilators may be hard drawn Type L copper, soldered joints, 95-5 solder.
 - b. 2-1/2" Through 4": Screwed pipe as above -OR- welded or grooved pipe as below.
 - c. 6" and Larger: Black steel pipe, ASTM A53. Schedule 40 for 10" and smaller, Standard weight for 12" and larger. Standard weight carbon steel welding fittings, long radius ells, ANSI B16.9. Joints may be grooved pipe unions, EPDM gaskets, Grinnell, Gruvlok, Victaulic.
 2. All Below Grade: Preinsulated. Steel pipe core - A106/A53, Grade B, seamless standard weight for pipe sizes 1-1/2" and smaller; A53, Grade B, ERW, standard weight for pipe sizes 2" and larger. Foamed polyurethane insulation, see paragraph 2.2, B for minimum insulation thicknesses. HDPE or PVC jacket. Pipe and fittings shall be socket welded for pipe sizes 1-1/2" and smaller, and butt welded for pipe sizes 2" and larger. Provide anchor points and bolster pads as required. Submit shop drawing from manufacturer showing

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anchor points and bolster pad locations. Perma-Pipe/Ricwil, Rovanco, Thermacor, Thermal Pipe Systems.

3. Valves and Specialties:

a. Valves:

- (1) General: Manufacturer's model numbers are listed to complete description. Equivalent models of Crane, Milwaukee, Nibco, Stockham, Walworth, as well as Grinnell, Gruvlok and Victaulic for grooved joint systems, are acceptable. All valves of a particular type or for a particular service shall be by the same manufacturer. Butterfly valves may be substituted for 2-1/2" and larger gate valves above grade; see specification below.
- (2) Gate Valve: Provide 2" extension necks at insulated pipes, where required. 2" and Smaller: All bronze. Rising stem. Union bonnet. Wedge disk. Screwed connection. Malleable iron handwheel. Class 125. Stockham B-105. 2-1/2" and Larger: Iron body, bronze mounted. Non-rising stem. Wedge disk. Class 125. Flanged or AWWA hub end as applicable. Stockham G-612. Underground valves shall have square operating nut. Provide one operating "T" handle for underground valves.
- (3) Butterfly Valve: Iron threaded lug body. Aluminum bronze disk. O-ring seals. Resilient, removable seat. 416 stainless steel shaft. 6" and smaller valves shall have multi-position lever handle. 8" and larger valves shall have gear operator. Provide 2" extension neck at insulated pipes. Demco Series NE, Grinnell, Stockham.
- (4) Plug Valve: Eccentric bronze or nickel plated semi-steel plug, semi-steel body, bronze bushings, Buna-N-rings. 175 psi WOG. KeyPort Valve Series 400.
- (5) Check Valve: Non-slam, lift type. Replaceable bronze seat, disk and bushings. Stainless steel helical spring. Disk guided at top and bottom. Flow area through valve shall exceed cross sectional area of pipe. 150 psi WOG. CPV, Mueller Steam Specialty. 2" and Smaller: Shall be screwed brass with hand lapped bronze disk. 2-1/2" and Larger: Shall be iron body, wafer or flanged with resilient Buna-N or TFE facing on seat.
- (6) Ball Valve: Full port. Bronze body, cap, stem, disk and ball. Screwed connection. Lever handle. TFE seat. O-ring seals. 300 psi WOG. Apollo, Nibco, Jomar.
- (7) Globe Valve: 2" and Smaller: All bronze. Renewable TFE disk. Screwed connection. Malleable iron handwheel. Union bonnet. Class 150. Stockham B-22. 2-1/2" and Larger: Iron body, flanged. Bronze mounted. Class 125. Rising stem. Bolted bonnet. Renewable seat and disk. Stockham G-512.
- (8) Valve Box: Pre-cast reinforced concrete. Cast iron lid marked for services. Christy F22 in foot traffic areas; G5 in roadways.

b. Instruments:

- (1) Pressure Gage: Phosphor bronze tube. Bronze bushed. 1% accuracy. Cast aluminum case. 3-1/2" white dial. Adjustable pointer. Operating pressure at midscale. 1/4" NPT brass socket. Provide brass porous core pressure snubber and gage cock. Trerice, Weksler, Winters.
- (2) Thermometer: 1" dial. 5" stainless steel stem suitable for use with Pete's Plug. Plastic case. 25-125°F with 1°F divisions for chilled water. 0-220°F with 2°F divisions for hot water. Tel-Tru, Winters.
- (3) Thermometer: 3" dial. Stainless steel case. Back or bottom connected as required. 1/2" NPT. 20-240°F, 2°F divisions for hot water, 25-125°F, 2°F divisions for chilled water. 2" insertion length. Allowance to be made for insulation thickness. Marshalltown, Moeller, Taylor, Tel Tru, Winters.
- (4) Thermometer Well: Brass well. Suitable for 3" dial thermometer above. Provide 2" extension at insulated pipes.
- (5) Gage Cock: Lever handle brass cock. 1/4" NPT connections. Provide 2"

- extension at insulated pipes.
- (6) Instrument Well: Suitable for temperature sensing element. Coordinate with supplier of temperature controls.
- (7) Flow Switch: Paddle type. McDonnell No. FS4-3.
- c. Miscellaneous Specialties:
 - (1) Pressure Relief Valve: ASME rated fully automatic, reseating pressure relief valve sized in accordance with energy input. Watts.
 - (2) Union: 2" and Smaller: AAR malleable iron, bronze to iron ground seat. 300 psi. Grinnell. Size 2-1/2" and Larger: Grooved pipe, synthetic gasket, malleable iron housing. Victaulic Style 77, type "E" gasket, Grinnell.
 - (3) Combination Reducing/Relief Valve: Iron body. Diaphragm operated. Brass internal parts. Reducing valve shall have a built-in strainer and check valve and have a field adjustable range of 10-25 psi and a 125 psi maximum working pressure. Relief valve shall be set at 30 psi. Bell and Gossett No. F-3.
 - (4) Balancing Cock: Calibrated all bronze balancing/shutoff valve or cock. Screwed connections. Memory stop. Position indicator. Drain connection. Taps for differential pressure gage, with check valves or shutoffs. 125 psi working pressure. Internal seals. Preformed insulation block. Armstrong, FlowSet by Flow Design, Inc., Grinnell, Tour and Andersson, Victaulic.
 - (5) Strainer: "Y" type, 125 psi. Machined seats. Stainless steel screens. Provide gate valve blowoff with hose threads. Bailey, Mueller Steam Specialty.
 2" and Smaller: Screwed bronze body. Perforation size 0.057".
 2-1/2" and Larger: Flanged iron body, perforation size as follows:

Pipe Size	Perforation Dia.
2-1/2" - 3"	1/16"
4" - 6"	3/32"
8" and Larger	1/8"
 - (6) Dielectric Coupling: Insulating union, flange or waterway fitting rated for 250 psig. EPCO, Clearflow.
 - (7) Expansion Tank: Pressurized diaphragm type or bladder type, as shown on drawings. Welded steel, ASME code construction with ASME stamp and certification, 125 psi, 240°F. Sealed elastomer diaphragm or heavy duty butyl bladder. Pre-charged with air to initial fill pressure of system. Base or saddle as required for mounting. Removable access cover for bladder type. Sight glass for diaphragm type (hot water service only). Amtrol, Taco.
 - (8) Flexible Connection: 2" and Smaller: Screwed connection. Corrugated bronze core covered with high tensile bronze tubular braid. 150 psi working pressure. Flexonics, Keflex. 2-1/2" and Larger: Contoured, molded Teflon bellows. Minimum of three convolutions. Monel reinforcing rings. Limit bolts. Flanged connection. 100 psi working pressure. Belmont, Resistoflex. -Or- Multiple laminations of 321 stainless steel. 150 psi working pressure. Limit bolts. Flanged connection. Hyspan Series 5500.
- B. Refrigerant Piping: Hard drawn Type ACR copper, dried and capped, ASTM B280. Wrought copper fittings, silver alloy brazed, 1100°F, Silfos.
- C. 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 recommendations. Felt liner for copper piping. Hanger and rod shall have galvanized finish. B-Line, Anvil, Unistrut.

- b. Insulation Support: Calcium silicate insulation, 100 psi, or heavy density fiberglass, 100 psi. Insulation thickness equal to adjoining pipe insulation. Steel support shield or saddle. Provide vapor barrier for chilled water piping. Insulation and/or vapor barrier shall extend 1" beyond steel support. Pipe hanger in accordance with paragraph 1 above. Increase hanger size per manufacturer's recommendation. B-Line, Pipe Shields, Inc., Uni-Grip.
 - c. 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.
 - d. 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: Flashing for piping through roof shall be prefabricated galvanized steel roof jacks with 16" square flange around pipe. Provide clamp-on storm collar and seal water tight with mastic. Maintain dielectric separation between copper and galvanized materials. For cold process built-up roof, material shall be 4 lb/ft² 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 50°F. 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. 1" thickness for chilled water piping. For hot water piping 140°F and less, thickness shall be 1" for pipe sizes less than 1", 1-1/2" thickness for pipe sizes 1" and larger. For hot water piping over 140°F, thickness shall be 1-1/2" for pipe sizes less than 1-1/2", 2" thickness for pipe sizes 1-1/2" and larger. CSG Insulation Corp., Knauf, Johns-Manville, Owens-Corning.
- C. Fiberglass Blanket: Unfaced, 1-1/2" thick. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft²-°F at a mean temperature of 50°F. 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. Reinforcing Mesh: 10 x 10 strands per square inch. Polyester or fiberglass. Mast-a-Fab, Vimasco Elastafab or Childers Chil Glas #10.
- F. 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. [Comply with LEED IEQc 4.2 VOC limits and LEED for Schools requirement for testing per California Dept of Public Health (CDPH) Standard Method Ver. 1.1, 2010 Small Scale Environmental Chamber Test for VOCs. for CA Specification 01350.]
- G. Lagging Adhesive: Childers CP-50A MV1, Foster 30-36.
- H. Aluminum Jacketing: Aluminum pipe and fitting jacketing, 0.016" thickness for straight pipe. 0.024" thickness for fittings. Integral moisture barrier. Stucco-Embossed finish. Provide pre-fabricated aluminum strapping and seals by same manufacturer. ITW or RPR.
- I. Outdoor Weather Barrier Mastic: Childers CP-10/11, Foster 46-50.
- J. Metal Jacketing Sealant: Childers CP-76, Foster 95-44 (gallon can quantities only; no tubes).
- K. 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.

- L. Foamed Plastic: Rubber based elastomeric preformed pipe insulation. Thermal conductivity shall not exceed 0.27 Btu-in/hr-ft²-°F at a mean temperature of 70°F. 1/2" thick. Provide adhesive by same manufacturer. Armacell Armaflex.

2.3 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).
 - 1. Grease Bearing Exhaust Ductwork: Exhaust ducts from Type I grease hoods shall be constructed in accordance with Chapter 5 of the California Mechanical Code with 16 gage galvanized steel or 18 gage stainless steel. Exposed duct shall be stainless steel. All joints shall be made with a continuous weld. See Mechanical Drawings, Sheets M3.02, M3.03, M3.04, M3.05.
- 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-°F at a mean temperature of 75°F. Seamless metalized reinforced polyester vapor barrier jacket. Duct shall comply with NFPA 90A. JP Lamborn. Duct Static Pressures of 1.0" W.C. and less: 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. Duct Static Pressures Greater than 1.0" W.C.: Continuous internal liner bonded between a dual galvanized steel wire helix. Duct shall be capable of continuous operation at 15" of water static pressure and 5,500 ft/min air velocity.
- 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 (Except Spiral Wound Exposed to View in Finished Areas): Fiber reinforced. White in color. Foster 32-17, Childers CP-148, Design Polymerics DP1030, Hardcast Versa-Grip 181, Hardcast CCWI-181. Spiral Wound Joints Not Exposed to Weather and Exposed to View in Finished Areas: Non fibrated. Gray in color. Foster 32-19, Childers CP-146, Design Polymerics DP 1010, or United Duct Sealer WB.
- E. Spiral Wound Metal Ductwork: Spiral wound factory fabricated galvanized steel, gages in accordance with the CMC. All fittings shall be factory fabricated. Fittings exposed to view shall have all seams fully welded. Tees and laterals shall be conical type. Connections to plenums shall be with bell-mouth fittings. 12" and smaller ells shall be two-piece die-stamped. Ells larger than 12" shall be five-piece. McGill Airflow. Shop fabricated fittings are not acceptable.

2.4 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

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- shall be reselected by the Contractor for the proper diffusion, spread, pressure drop, throw and noise level.
3. Frame and Accessories: All 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. Extractor: Curved blade turns in adjustable position rigid frame. Tuttle and Bailey Deflectrol.
- D. Turning Vanes: Double wall, hollow metal, air foil shape. Spacing in accordance with manufacturer's recommendations. Aero Dyne HEP.
- E. Flexible Connection: UL listed neoprene coated 30 ounce fiberglass cloth. 3" metal, 3" fabric, 3" metal. Ventglas.
- F. Duct Access Door:
1. Rectangular: Insulated double wall door. Full piano hinge. Cam latch. Pressure rating to match application. Air Balance, Ductmate.
 2. Round: Three layers of stamped steel. Inside panel shall consist of two layers of metal which are spotwelded together along the rim, encapsulating high density fiberglass insulation (25/50 rated). Closed cell neoprene gasket bonded to the inside of the door. Zinc plated conical springs installed between the inner and outer door. Polypropylene molded knobs with threaded metal inserts. Knobs shall be easily turned by hand and shall be UL94HB listed. Zinc plated carriage bolts, clinched and sealed to the inner door. Provide self adhesive template for the exact size of duct opening. Pressure rating to match application. Ductmate.
- G. Kitchen Hood:
1. General: Factory fabricated in accordance with CMC Chapter 5 and State codes. Install with bottom of hood 48" above cooking surface. UL labeled. CaptiveAire. See Drawings Sheets M4.01, M4.02, M4.03, M4.04.
 2. Materials: Unless otherwise noted, all visible elements of the hood shall be constructed of stainless steel, 18 gage, type 304, with a No. 4 polished finish. All seams shall have a liquid tight, continuous weld, ground smooth and polished. Provide factory stainless steel enclosure panels.
 3. Filters: Filters shall be fixed baffle type. 20 gage stainless steel construction. Filters shall be furnished with handles. Blank panels shall be installed where required to symmetrically space filters. 20 gage full length stainless steel filter rack with continuous, removable, stainless steel grease trough.
 4. Lights: UL listed vapor proof lights. Conduit and conductors shall be pre-wired to a J-box on top of canopy.

2.5 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 75°F 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. **Installed** thermal resistance at a mean temperature of 75°F shall meet or exceed indicated value. One side coated with anti-microbial coating to prevent mold growth and fiber erosion up to 6000 ft/min. Average noise reduction coefficient of 0.80. 1.5 lb/ft³ 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.
- E. Fire Resistive Duct Wrap: Nominal 1-1/2" thick, 6 lb/ft³ high-temperature fiber blanket thermal insulation encapsulated in a fiberglass-reinforced aluminized polyester foil. Grease Duct Listing Standards (Double Wrap) ASTM E 2336 / ICC-ES AC101. Ventilation Duct Listing Standard (Single Wrap) – ISO 6944. 3M Fire Barrier Duct Wrap 615+.

2.6 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.
 - 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,

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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 - 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 after air balance is completed and 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. Water Chiller/Water Heat Pump:
- 1. General: Modular chiller/heat pump systems consist of individual modules that shall be assembled on site. Refer to Paragraph 2.6A for general requirements. Each module shall be completely factory wired and tested prior to shipment. Each module includes compressor(s), heat exchanger(s), air-cooled condenser (air-cooled modules only), and controls. Controls shall be designed on a distributed primary control system that allows the primary controller to operate remaining secondary modules in the event of a malfunction of any secondary controller. The controls shall be designed to allow each individual secondary controller to operate on its own temperature sensor if there is a failure of the primary controller. Trane

2. Refrigeration Circuits: An enhanced vapor injection compressor shall be provided on each refrigeration circuit for greater heating performance in low ambient temperatures. Dual independent refrigeration circuits provided in each module each with oil level sight glass, suction gas-cooled motor with solid-state sensors in the windings for overload protection, and circuit breaker protection. There shall be two independent compressors and refrigerant circuits per module. Compressors shall be mounted to the formed sheet metal frame with rubber-in-shear vibration isolators. The heat pumps use dual circuit, brazed plate heat exchangers that functions as an evaporator or condenser depending on the operational mode. They shall be constructed of 316 stainless steel plates and copper brazing. The supply and return fluid piping connections to each brazed plate heat exchanger include an electronic and a manual isolation valve to allow servicing of each module individually while the remaining modules continue to operate, and to allow for variable flow. The fluid connections to each heat exchanger use roll grooved couplings for service convenience and ease of installation. Each heat exchanger shall be insulated with ¾ inch closed cell insulation. The maximum working pressure shall be 650 psi. Heat exchanger piping fluid velocity cannot exceed 10 fps at any point in the system.
3. Air Coils and Fans: The air coils have aluminum fins mechanically bonded to copper tubes that functions as an evaporator or condenser depending on the operational mode. The coils shall be factory tested to a minimum of 600 psig. The air coil fan motors shall be maintenance free, highly efficient Electronically Commutated Motors (ECM) with energy reduction capabilities of up to 35%. The fan motors vary speed to maintain the refrigeration head pressure.
4. Compressor: An enhanced vapor injection scroll compressor shall be provided on each refrigeration circuit for greater heating performance in low ambient temperatures. For select models, the Copeland compressor uses CoreSense technology as a sensor to unlock advanced capabilities such as protection, diagnostics, communication, and verification. Technicians can make faster, more accurate decisions resulting in improved compressor performance and reliability.
5. Unit Controls: The primary chiller module incorporates the primary controller. The primary controller communicates with the remaining secondary controllers in each module via a local network communications protocol. The primary controller may include a phase monitor to protect against low voltage, phase unbalance, phase loss, and phase reversal conditions. The primary controller reads all analog and fault port values from all secondary module controllers and pass these values to the Building Automation System via BACnet protocol. Each chiller/heat pump control system may include operational switches for each compressor; high- and low-pressure transmitters to provide indication of refrigeration pressures in each circuit; high and low refrigeration pressure alarms including shutting shut down the faulty compressor(s); anti-short cycling compressor timers; minimum compressor run timers; connection to Building Automation System.
6. Factory Start-up: Provide factory start-up.

C. Pumps:

1. General: Refer to Paragraph 2.6A for general requirements. Pumps shall be selected to be non-overloading at any point on the pump curve. Contractor shall include all costs required to field trim or change pump impeller, if necessary, to match design conditions. All motors 1 horsepower and larger shall be the high efficiency type. Bell and Gossett, Grundfos, PACO, Peerless, Taco.
2. Materials and Components: Enclosed bronze impeller hydraulically and dynamically balanced on shaft. Renewable bronze wear rings. Mechanical seals unless otherwise noted. Stainless steel shaft or steel shaft with bronze sleeve. Gray iron casing. Suction and discharge connections shall be 125 psi flanges tapped for pressure readings.
3. In-Line Centrifugal: In-line single stage, end suction centrifugal pump close coupled to motor. Pipe supported or cast iron support stand as indicated on drawings.

D. Air Handler:

1. General: Pressure classification, type, and accessories/options as indicated on schedules. Refer to Paragraph 2.6A for general requirements. All units will be shipped with an integral

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base frame designed with the necessary number of lift points for safe installation. The lift points will be designed to accept standard rigging devices and be removable after installation. Units shipped in sections will have a minimum of four points of lift. Sizes 3-30 will also be shipped with a shipping skid designed for forklift transport. Units will be shipped with a shipping skid designed for forklift transport and the integral base will be designed with the necessary number of lift points for safe installation. The lift points will be designed to accept standard rigging devices and removable after installation. Units shipped in sections will have a minimum of four points of lift. Per ASHRAE 62.1 recommendation, units will be shipped stretch-wrapped to protect unit from in-transit rain and debris. Unit shall be UL and C-UL Listed. Air-handling performance data shall be certified in accordance with AHRI Standard 430. Unit sound performance data shall be provided using AHRI Standard 260 test methods and reported as sound power. Coil performance shall be certified in accordance with AHRI Standard 410. Manufacturer provided VFDs shall be certified to AHRI Standard 1210 "Performance Rating of Variable Frequency Drives" to ensure documented and reliable VFD efficiency. Trane.

2. Unit Construction: All unit panels shall be 2-inch solid, double-wall construction to facilitate cleaning of unit interior. Unit panels shall be provided with a mid-span, no through metal, internal thermal break. Casing thermal performance shall be such that under 55°F supply air temperature and design conditions on the exterior of the unit of 81°F dry bulb and 73°F wet bulb, condensation shall not form on the casing exterior. All exterior and interior AHU panels will be made of G40 galvanized steel. Optionally, all interior AHU casing panels will be made of 201 stainless steel. The casing shall be able to withstand up to 8 inches w.g. positive or negative static pressure. The casing shall not exceed 0.0042 inch deflection per inch of panel span at 1.5 times design static pressure up to a maximum of +8 inches w.g. in all positive pressure sections and -8 inches w.g. in all negative pressure sections. The unit floor shall be of sufficient strength to support a 300-lb. load during maintenance activities and shall deflect no more than 0.0042 inch per inch of panel span. The casing air leakage shall not exceed leak class 9 (CL = 9) per ASHRAE 111 at 1.25 times maximum casing static pressure (P in inches w.g.), up to a maximum of +8 inches w.g. in all positive pressure sections and -8 inches w.g. in all negative pressure sections, where maximum casing leakage (cfm/100 ft² of casing surface area) = CL x P^{0.65}. Optionally, the casing air leakage shall not exceed leak class 6 (CL = 6) per ASHRAE 111 at 1.25 times maximum casing static pressure (P in inches w.g.), up to a maximum of +8 inches w.g. in all positive pressure sections and -8 inches w.g. in all negative pressure sections, where maximum casing leakage (cfm/100 ft² of casing surface area) = CL x P^{0.65}.
3. Insulation: Panel insulation shall provide a minimum thermal resistance (R) value of 13 ft²•h•°F/Btu throughout the entire unit. Insulation shall completely fill the panel cavities in all directions so that no voids exist and settling of insulation is prevented. Panel insulation shall comply with NFPA 90A.
4. Drain Pans: All cooling coil sections shall be provided with an insulated, double-wall, galvanized or stainless-steel drain pan. To address indoor air quality (IAQ), the drain pan shall be designed in accordance with ASHRAE 62.1 being of sufficient size to collect all condensation produced from the coil and sloped in two planes promoting positive drainage to eliminate stagnant water conditions. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition. All drain pan threaded connections shall be visible external to the unit. Drain connections shall be of the same material as the primary drain pan and shall extend a minimum of 2 1/2 inches beyond the base to ensure adequate room for field piping of condensate drain traps. Coil support members inside the drain pan shall be of the same material as the drain pan and coil casing. Heating coil, access, and mixing sections may be provided with an optional IAQ drain pan.
5. Access Doors: Access doors shall be 2-inch double-wall construction. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels, respectively. All doors downstream of cooling coils shall be provided with a thermal break construction of door panel and door frame. Gasketing shall be provided around the full perimeter of the doors to prevent air leakage. Surface-mounted handles shall be provided to

allow quick access to the interior of the functional section and to prevent through-cabinet penetrations that could likely weaken the casing leakage and thermal performance. Handle hardware shall be designed to prevent unintended closure. Access doors shall be hinged and removable for quick, easy access. Hinges shall be interchangeable with the door handle hardware to allow for alternating door swing in the field to minimize access interference due to unforeseen job site obstructions. Door handle hardware shall be adjustable and visually indicate locking position of door latch external to the section. All doors shall be a minimum of 60 inches high when sufficient height is available, or the maximum height allowed by the unit height. Door handles will be provided for each latching point of the door necessary to maintain the specified air leakage integrity of the unit. Optionally, a single-handle door shall be provided for all outward swinging doors linked to multiple latching points necessary to maintain the specified air leakage integrity of the unit. An optional shatterproof window for viewing, capable of withstanding unit operating pressures, shall be provided in the door.

6. Fans: The fan type shall be provided as required for stable operation and optimum energy efficiency. The fan shall be statically and dynamically balanced at the factory as a complete fan assembly (fan wheel, motor, drive, and belts). The fan shaft shall not exceed 75 percent of its first critical speed at any cataloged speed. Fan wheels shall be keyed to the fan shaft to prevent slipping. The fan shafts shall be solid steel. The fan section shall be provided with an access door on the drive side of the fan. The fan shall be a single-width, single-inlet plenum fan. The fan blades shall be aluminum backward-inclined airfoil. Plenum fan shall be direct-driven. Fan sections containing multiple fans shall be controlled using a common control signal, such as the duct static control signal, to modulate the fan speed. The fan and motor assembly (on sizes 10 to 120) shall be internally isolated from the unit casing with 2-inch (50.8-mm) deflection spring isolators, furnished and installed by the unit manufacturer. The isolation system shall be designed to resist loads produced by external forces, such as earthquakes, and conform to the current IBC seismic requirements. The motor shall be integrally mounted to an isolated fan assembly furnished by the unit manufacturer. The motor shall be mounted inside the unit casing on an adjustable base to permit adjustment of drive-belt tension. The motor shall meet or exceed all NEMA Standards Publication MG1 requirements and comply with NEMA Premium efficiency levels when applicable. The motor shall have T-frame, squirrel cage with size, type, and electrical characteristics as shown on the equipment schedule. The motor shall be open and drip-proof, 460 volt, 3-phase, 60 Hz. The fan section shall have motor leads extended to a factory-installed external junction box to facilitate motor wiring and to maintain air leakage integrity of the casing. The fan motor wiring shall be factory-wired to the external motor junction box within flexible metal conduit of adequate length so that the fan vibration isolation will not be restricted. On units supplied with plenum fans, expanded metal door guard(s) shall be supplied on the access door(s) to the fan, and those downstream access door(s) where unintended access to the plenum fan could occur. Door guard in intended to deter unauthorized entry and incidental contact with rotating components. Refer to the Product Data section for fans with access door guard(s).
7. Coils: See paragraph 2.6, A, 13 for coils. Coils section header end panel shall be removable to allow for removal and replacement of coils without impacting the structural integrity of the unit. Install coils such that headers and return bends are enclosed by unit casing to ensure that if condensate forms on the header or return bends, it is captured by the drain pan under the coil. Coils shall be manufactured with plate fins to minimize water carryover and maximize airside thermal efficiency. Fin tube holes shall have drawn and belled collars to maintain consistent fin spacing to ensure performance and air pressure drop across the coil as scheduled. Tubes shall be mechanically expanded and bonded to fin collars for maximum thermal conductivity. Use of soldering or tinning during the fin-to-tube bonding process is not acceptable due to the inherent thermal stress and possible loss of bonding at that joint. Construct coil casings of galvanized steel. End supports and tube sheets shall have belled tube holes to minimize wear of the tube wall during thermal expansion and contraction of the tube. All coils shall be completely cleaned prior to installation into the air handling unit. Complete fin bundle in direction of airflow shall be degreased and steam cleaned to remove any lubricants used in the manufacturing of the fins, or dirt that may

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have accumulated, in order to minimize the chance for water carryover. When two or more cooling coils are stacked in the unit, an intermediate drain pan shall be installed between each coil. The intermediate drain pan shall be designed being of sufficient size to collect all condensation produced from the coil and sloped to promote positive drainage to eliminate stagnant water conditions. The intermediate drain pan shall be constructed of the same material as the sections primary drain pan. The intermediate drain pan shall begin at the leading face of the water-producing device and be of sufficient length extending downstream to prevent condensate from passing through the air stream of the lower coil. Intermediate drain pan shall include downspouts to direct condensate to the primary drain pan. The intermediate drain pan outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition.

8. Filters: Filter sections shall have filter racks, at least one access door for filter removal, and filter blockoffs to prevent air bypass around filters. The filter sections shall be supplied with 2-inch filters. The filters shall be 2-inch, made with 100 percent synthetic fibers that are continuously laminated to a supported steel-wire grid with water repellent adhesive. Filters shall be capable of operating up to 625-fpm face velocity without loss of filter efficiency and holding capacity. The filters shall have a MERV 13 rating when tested in accordance with the ANSI/ASHRAE Standard 52.2.
9. Mixing Section: A functional section shall be provided to support the damper assembly for outdoor, return, and/ or exhaust air. Dampers shall modulate the volume of outdoor, return, or exhaust air. The dampers shall be of double-skin airfoil design with metal, compressible jamb seals and extruded-vinyl blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. Airfoil dampers shall be rated for a maximum leakage rate of 3 cfm/ft² at 1 in. w.g. complying with ASHRAE 90.1 maximum damper leakage. All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Dampers may be arranged in a parallel or opposed-blade configuration.
10. Outdoor Unit Paint: External surface of unit casing shall be prepared and coated with a minimum 1.5 mil enamel finish or equal. Units supplied with casing exterior factory-painted shall be able to withstand a salt spray test in accordance with ASTM B117 for a minimum of 500 consecutive hours. Unit casing exterior will be provided with manufacturer's standard color, or alternative color when required.
11. Outdoor Unit Roof: Trane engineered inner roofs incorporate mid-span, internal thermal breaks to eliminate thermal conduction paths from the interior of the air handler to the exterior (2-inch R13 foam-insulated). Inner/ Indoor/ roof will be installed in such a manner as to prevent air bypass between internal components. A single layer Outer/Outdoor roof is utilized above the inner roof and will be sloped at a minimum 0.125 inches per foot either from one side of unit to other, or from center to sides of the unit. Roof assembly will overhang all walls of units by a 1.5-inch minimum.
12. Access/Inspection Sections: A section shall be provided to allow additional access/inspection of unit components and space for field-installed components as needed. The section length shall be variable to accommodate specific access, spacing, or dimensional requirements. An access door shall be provided for easy access. All access sections shall be complete with a double-wall, removable door downstream for inspection, cleaning, and maintenance. Interior and exterior door panels shall be of the same construction as the interior and exterior wall panels, respectively. All doors downstream of cooling coils shall be provided with a thermal break construction of door panel and door frame.
13. Controls: Field supplied VFD shall be mounted externally on the fan section in a NEMA Type 1 enclosure (unit sizes 3-120) or internally in a NEMA Type 4 equivalent unit casing (unit sizes 3-120) within a dedicated controls section or housed fan section. The internal enclosure shall be an integral part of the unit casing to allow for thermal venting to casing interior, but shall be accessible from unit exterior through access door. Internally mounted starters/VFDs shall have doors with the same construction as other doors on unit. An external disconnect shall be mounted through the access door to the starter or VFD to disconnect full power from starter/VFD, lights, or control power.
14. Start-up: Provide equipment startup by factory or factory trained technicians.

- E. Dedicated Outside Air Unit (OSA-1):
1. General: Self-contained heating/cooling unit designed for outdoor installation. Factory assembled and tested. Refer to Paragraph 2.6A for general requirements. Provide all starters and relays required for operation. 24-volt control circuit from integral transformer. Weatherproof cabinet, galvanized steel with enamel finish. Outside air inlet. Drain pan. Multivane centrifugal supply fan. ARI certified. Gas equipment AGA certified. CaptiveAire. See Drawings Sheets M4.01, M4.02, M4.03, M4.04 for more info.
 2. Refrigeration: Sealed hermetic compressor with internal vibration isolating mount. Crankcase heater, high/low pressure switch, recycling timer. Air-cooled condenser with propeller fan. Non-ferrous finned coil. Low ambient control to 45°F. Single phase units shall have compressor start assist kit. 5-year extended warranty on compressor(s).
 3. Heat: Natural gas fired. Low NOx. Aluminized or ceramic coated welded steel heat exchanger. Electric ignition. Automatic gas valve. Fan and limit controls.
- F. Exhaust Fan:
1. General: All exhaust fans shall be tested according to AMCA Standard 210 in an AMCA registered laboratory. 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, unless otherwise noted. All motors 1 horsepower and larger shall be the premium efficiency type.
 2. Kitchen Hood Fan: Spun aluminum, roof mounted, direct driven, upblast centrifugal exhaust ventilator. Fan shall be UL 762 listed. Fan shall be of bolted and welded construction utilizing corrosion resistant fasteners and stainless-steel fasteners on cap. Spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure. Aluminum base shall have a one-piece inlet spinning and continuously welded curb cap corners for maximum leak protection. Windband shall have a rolled bead for added strength. A two-piece top cap shall have stainless steel quick release latches to provide access into the motor compartment without the use of tools. An integral conduit chase shall be provided into the motor compartment to facilitate wiring connections. The motor shall be enclosed in a weather-tight compartment, separated from the exhaust airstream. Unit shall bear an engraved aluminum nameplate. Wheel shall be centrifugal backward inclined, constructed of 100 percent aluminum, including a precision machined cast aluminum hub. An aerodynamic aluminum inlet cone shall be provided for maximum performance and efficiency. Motor shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase and enclosure. Exhaust fan shall have roof curb and hinged base with lock hasp and galvanized aircraft cable supports. Weep hole. CaptiveAire. See Drawings Sheets M4.01, M4.02, M4.03, M4.04.
 3. Roof Fan (EF-2 thru EF-6): Spun aluminum, roof mounted, direct driven, downblast centrifugal exhaust ventilator. Fan shall be of bolted and welded construction utilizing corrosion resistant fasteners and stainless-steel fasteners on cap. Spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure. Aluminum base shall have continuously welded curb cap corners for maximum leak protection. Discharge baffle shall have a rolled bead for added strength. An integral conduit chase shall be provided through the curb cap and into the motor compartment to facilitate wiring connections. Motor shall be enclosed in a weather-tight compartment, separated from the exhaust airstream. Unit shall bear an engraved aluminum nameplate. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub. An aerodynamic aluminum inlet cone shall be provided for maximum performance and efficiency. Motor shall be heavy duty type with permanently lubricated sealed bearings and furnished at the specified voltage, phase and enclosure. Backdraft damper. Greenheck.
- G. Indoor / Outdoor Unit (IDU/ODU):

1. General: Refer to Paragraph 2.6A for General Requirements. Completely assembled and factory tested. Provide all starters and relays required for operation. All components by same manufacturer. Trane.
2. Outdoor Unit:
 - a. Compressor: Variable speed sealed hermetic rotary compressor with vibration isolator mountings. Crankcase heater, suction line accumulator, recycling timer. High and low head pressure/temperature protection. Motor overload protection, low ambient feature to 20F cooling mode. High and low side service valves. Recycling timer. Single phase start assist kit. 5-year extended warranty.
 - b. Fan and Coil: Finned tube non-ferrous coil. Propeller type fan, 1200 RPM maximum, direct drive. Totally enclosed motor, overload protected, permanently lubricated, resiliently mounted.
 - c. Cabinet: Weatherproof, factory paint.
3. Indoor Units:
 - a. Supply Fan: Direct drive, multi-speed forward curve, centrifugal fan, resiliently mounted. Thermally protected motor.
 - b. Indoor Coil: Copper tube, aluminum fin, DX coil.
 - c. Electric Heaters: Integral part of unit, complete with all operational and safety controls, single point wiring terminal, 5-year factory warranty, UL listed as a complete unit.
 - d. Condensate Pan: Install under complete coil area with drain connections.
 - e. Filter: Washable media. Class 2 or better.
4. Controls: Microprocessor control containing temperature selection, room temperature indication, automatic cooling/heating changeover, malfunction alarm, power failure automatic restart safety, and emergency operation function.

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. Lines shall be adequately braced against vertical and lateral movement. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted. Pipe sizes shall not decrease in direction of flow, 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. Welded or Brazed: Filler rod shall be of suitable or the same alloy as pipe. Brazing filler metal shall have a minimum melting point of 1100°F. Welding or brazing shall be performed by a Certified Welder or 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 (eccentric bell for steam service). 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. At equipment connections, valves shall be full size of upstream piping. Provide a shut-off valve at each point of connection to existing 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. For situations where this is not practical or where valves are greater than 10' above floor, chain wheel operators shall be provided. Chain shall extend down to 7' above the floor. All such installations must have prior review by the Engineer.

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. Refer to drawings for additional requirements and attachment to structure. 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.

<u>Pipe Size (In.)</u>	<u>Maximum Spacing</u>	
	<u>Between Supports (Ft.)*</u>	
	<u>Copper</u>	<u>Sch. 40 Steel</u>
1/2	6	6
3/4	6	8
1	6	8
1-1/4	6	8
1-1/2	6	10
2	10	10
2-1/2	10	10
3	10	10
4	10	10

*Based on straight lengths of pipe with couplings only. Provide additional supports for equipment, valves or other fittings. Seismic requirements may reduce maximum spacing.

- b. Chilled/Hot Water Piping: Support individual pipes with insulation support and pipe hanger. Install per manufacturer's recommendations. Piping shall have complete vapor seal.
 - c. Refrigerant Piping: Support insulated refrigerant line with construction channel and sheet metal support saddle or Cooper B-Line Armafix clamps. 5' spacing. Use isolation shield for uninsulated pipe. When using pre-charged tubing, all changes of direction shall be made with bending tools producing neat uniform bends. Free hand bends will not be accepted.
 - d. 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 escutcheons where piping penetrates walls, ceilings, or floors in finished areas.
 - b. Pipe Sleeves: All piping passing through concrete or concrete block shall be provided with pipe sleeves. Allow 1" (nominal) clearance between sleeve and pipe or pipe insulation. Piping through walls or footings below grade shall be sealed with Link-Seal.

- 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. Thermometer or Pressure Gage Tap: Provide tee for instrument well. Minimum size of pipe surrounding well shall be 1-1/2". Mount on side of pipe.
 - e. 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.
- B. Chilled/Hot Water Piping: Provide shut-off valve for each building and at each connection to equipment. Before threading, welding or grooving any pipe, it shall have a cloth material of the proper size pulled through pipe to clean out any foreign material, and then a visual inspection through pipe to verify it is clean. Any process done to pipe end will require that pipe end be inspected inside before a fitting is fitted to pipe (to insure that cutting oil or pipe burrs are removed). Always have pipe threading machine sloped to prevent cutting oil from running into the pipe. Branch lines leaving horizontal lines shall leave on the horizontal or at an upslope of 45°, unless they are rising up to another horizontal line which will insure the pipe to remain air free. All high points in any part of the system shall have the means to purge air. Unless otherwise noted all vents shall be 1/4" petcocks with 1/4" copper tube discharge. Route tube to condensate pan, floor sink, etc. If a drain point is not available, terminate tube with a return bend to allow water to be collected. Before connection to equipment, all piping shall be thoroughly flushed with water. Only equipment mounted on vibration isolators shall be connected with flexible connection. The manufacturer of the underground piping system shall instruct the installer regarding the manufacturer's required installation procedures. The manufacturer shall also provide sufficient job-site inspection to insure that the work is being accomplished in accordance with the plans, specifications and manufacturer's requirements. Upon completion of the installation, a certificate shall be furnished to the Architect by the manufacturer of the system, certifying the installation was made in accordance with his requirements and in compliance with the plans and specifications.
- C. Refrigerant Piping: Pipe shall be cut square. Joint surfaces shall be thoroughly cleaned, fitted and erected before brazing. After installation, evacuate to 29 inches of mercury, ambient temperature during evacuation shall not be less than 70°F. After evacuation, fill with dry nitrogen to 250 psi and maintain for two-hour period without additional charge. After nitrogen test, purge with refrigerant charged through dryer and maintain holding charge in system and equipment. Refrigerant piping below grade shall be run in 4" (min.) PVC conduit with long radius ells. Seal ends of conduit watertight.

3.2 PIPING INSULATION INSTALLATION:

- A. Chilled/Hot Water Supply and Return:
- 1. General: All chilled/hot water supply and return piping (including all fittings and accessories) and all chilled/hot water equipment shall be insulated. Insulate a sufficient length of make-up water piping to prevent condensation.
 - 2. Pipe: Apply pre-molded fiberglass sections to pipe using integral pressure sealing lap adhesive in accordance with manufacturer's recommendations. Stagger longitudinal joints. Seal butt joints with factory supplied pressure sealing tape.
 - 3. Fittings and Valves:
 - a. Wrap all fittings and valves with pre-cut fiberglass blanket to thickness matching adjoining insulation. Cover blanket with PVC jacket, solvent welded. Seal all joints with factory supplied pressure sealing vapor barrier tape with a 1-1/2" (min.) overlap on both sides of joint. Insulate all flanges, unions and valves except stems and operators. All joints on chilled/hot water piping shall be sealed with vapor barrier coating in addition to the vapor barrier tape.
 - b. For miscellaneous fittings and accessories for which PVC jackets are not available or where proximity of fittings precludes a neat-appearing installation, the

- Contractor may cover the fiberglass blanket with reinforcing mesh, one coat of lagging adhesive, and a final coat of vapor barrier coating.
4. Vapor Barrier Continuity: All exposed ends of insulation and all gaps or voids in vapor barrier shall be sealed with reinforcing mesh, one coat of lagging adhesive and a final coat of vapor barrier coating. Build up all horizontal areas to prevent water accumulation.
 5. Pipe Hangers: Seal all joints at pipe hangers with vapor barrier tape. Joints on chilled/hot water piping shall be sealed with vapor barrier coating in addition to the vapor barrier tape.
 6. Piping Exposed to Weather:
 - a. All piping and fittings exposed to weather shall have, in addition to the above described insulation, an aluminum jacketing. Insulation at grooved pipe couplings shall be covered with aluminum flange fitting covers. Secure in place with factory supplied straps. Install all joints and seams to prevent water entry, seal with 1/8" bead of gray metal jacketing sealant.
 - b. For miscellaneous fittings for which aluminum jackets are not available or where proximity of fittings precludes a neat-appearing installation, the Contractor may cover the insulation with reinforcing mesh and at least two coats of outdoor mastic. Plastic fitting covers shall not be used where exposed to weather.
 7. Additional Finish for Exposed Piping and Equipment: All piping and equipment exposed to view but protected from the weather shall be given an additional finish of PVC jackets. Do not install this jacket where it will be subjected to a temperature of 150°F or more such as immediately adjacent to boilers. In these locations install reinforcing mesh, one coat of lagging adhesive and a final coat of vapor barrier coating.
 8. Equipment: Chilled/hot water equipment with continuous circulation (pumps, heat exchanger, etc.), shall be insulated with materials similar to those described in Paragraph 2.2. It shall be the Contractor's responsibility to provide adequate insulation to prevent condensation, a complete vapor barrier, weatherproofing for equipment exposed to the weather, and a neat-appearing installation. Submit materials and method of installation to Engineer for review.
- B. Refrigerant Piping: Cover suction piping with foamed plastic insulation. Longitudinal and end seams shall be thoroughly cemented with adhesive in accordance with manufacturer's recommendations. Cover all fittings, unions, valves and connections. Piping exposed to view shall be covered with PVC jacketing. Piping exposed to weather shall be covered with aluminum jacketing, install all joints and seams to prevent water entry, seal with 1/8" bead of gray metal jacketing sealant.

3.3 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. Remote regulator shall be as detailed on drawings.
 3. Flexible Connections: Connection of ductwork to any vibrating equipment shall be with 3" (min.) flexible connection. Install with ample slack and uniform gap. There shall be no metal to metal contact across flexible connection. Flexible connections exposed to weather shall have a protective sheet metal cover.
 4. 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 metal ductwork not exposed to weather but exposed to view 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. Spiral Wound Metal Ductwork: At side duct grilles, the grille shall be cut directly into the spiral duct. Duct to duct joints shall be made with the spiral seam rotated so that the seam forms a continuous helical pattern across the joint.
4. Grease Bearing Exhaust Ductwork: Horizontal portions of the duct shall slope down towards the hood at 1/4" per foot (min.) unless the total horizontal length exceeds 75 feet, then the slope shall be 1" per foot (min.). Provide access panels at changes of direction as required by CMC. Drains shall be provided at low points in horizontal ducts per 2022 CMC 510.1.3. Horizontal ducts shall be provided with access in accordance with 2022 CMC Section 510.3.3.

3.4 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.

3.5 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. Concealed Ductwork: Wrap concealed ductwork including outside air intakes with fiberglass blanket lapped 2" minimum. Secure with staples 4" on centers maximum on straight runs and 3" maximum at elbows and fittings. Insulation on bottom of ducts wider than 36" shall also be secured with mechanical fasteners at 24" on center.
- D. 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 or evaporative cooling ductwork. 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.

- E. Fire Resistive Wrapped Ducts: Where indicated on drawings, ductwork shall be covered with fire resistive duct wrap. Install in accordance with it's UL or Omega Point Laboratories Design number (as applicable) and the Manufacturer's Installation Instructions.

3.6 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. Air Handling Units: Spring isolators shall be adjusted to allow movement to maximum free spring length. Piping support shall be designed so that piping weight does not bear on equipment. Hot water coil shall be mounted upstream of chilled water coil.
- C. Balance: Fans shall be statically and dynamically balanced in unit. Maximum allowances are: 2 mils to 600 rpm; 1-1/2 mils to 900 rpm; 1 mil to 1200 rpm; 3/4 mil to 1800 rpm; and 1/2 mil to 2200 rpm.
- D. Gage Taps: Gage taps, such as Pete's Plugs, shall be installed immediately adjacent to all heat exchanger and pump connections (i.e. inlet and outlet of all pumps, boilers, chillers, condensers, coils, etc.). Taps shall be installed to allow for a pressure gage or thermometer to be easily inserted and read. Provide 1 set of gages (pressure gage with Pete's Plug adapter, chilled water thermometer and hot water thermometer). Deliver to Owner.
- E. 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.
- F. Pumps: Install pumps with a minimum of 8 diameters of straight pipe at the pump suction unless a suction diffuser is installed. Sufficient clearance to wall or other obstructions shall be provided so that motor and rotating parts can be removed without disassembly of volute or piping. Anchor bolt configuration shall be compatible with this method of removal. Pedestal mounted pumps shall have their bases grouted. Realign pump and motor according to Hydraulic Institute Standards after grouting and connection of piping.
- G. Equipment Platforms: Shall be as shown on drawings and as follows: Flashing and platform cover shall be 22 gage (min.) sheet metal. All joints and seams shall be soldered with 2" (min.) overlaps. Provide 3/4" gap around perimeter between roofing and platform cover to facilitate re-roofing. Extend drip lip down 3" (min.). Provide 30# felt under platform cover.

3.7 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.
- B. Piping Tests:
 - 1. General: Tests may be made in sections, however, all connections between sections previously tested and new section must be included in the new test. 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. Water Piping: Maintain 100 psig water pressure for 4 hours.

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. Three 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.

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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.

END OF SECTION

SECTION 23 09 23 - DIRECT DIGITAL CONTROL AND ENERGY MANAGEMENT SYSTEM

PART 1 GENERAL

1.1 GENERAL MECHANICAL PROVISIONS:

- A. The General Mechanical Provisions of Section 23 00 00 shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

- A. General: The direct digital control and energy management system (DDC/EMS) includes control panels, control devices, valves, actuators, all line and low voltage control and interlock wiring (including wiring to controllers, switches, timers, relays, etc.) and conduit and related equipment, as required for proper operation of all equipment. Provide all equipment, programming, labor, materials and services necessary for a complete, lawful and operating DDC/EMS as shown or noted on the drawings and as specified herein. All control wiring, line and low voltage shall be installed in conduit. Power wiring, power to DDC/EMS control panels and disconnect switches are included in the Electrical Specifications, except that power wiring for control devices such as controllers, valves, etc., is included in the control system. Electrical work shall be in accordance with Electrical Specifications. Set, test and adjust the system for proper operation. The controls system shall be direct digital control/electric. Johnson Metasys, without substitution, to match existing. Provided and installed by Bedard Controls, 559-271-8990, No Exceptions. Except as otherwise noted, the control system shall consist of all Ethernet Network Controllers. The system shall be BACnet protocol and shall be compatible with existing district-wide system. The system shall communicate over the District's Ethernet LAN/WAN, and shall include the latest upgrading (software and firmware) during the warranty period. All existing network controllers on District School sites shall have their software upgraded to the same revision as that installed at this site. The data wiring shall have an Ethernet connection at the DDC/EMS panel and at the onsite workstation. If the District's current Graphical User Interface is server based, the GUI must be integrated into the District's current GUI server. The design of the total installed system shall be based on such systems, which are the District standards. Coordinate with Section 23 00 01, Heating, Ventilating and Air Conditioning and with Division 26.
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. 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 four 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.
- C. Submittals: Within 60 days of contract award, submit eight (8) copies of shop drawings showing the following aspects of the DDC/EMS system (CAD file with DXF format if required of floor and site plans can be secured from the Architect).
1. All termination points, terminal cabinets, and cabling.
 2. Schedule of input and output points.
 3. Locations of all visible DDC/EMS system components (i.e. interior and exterior sensors, terminal strips, panels, trench and pull boxes, etc.), identifying specifically any exposed conduit.

4. Complete written sequence of operation.
 5. Descriptive literature for all material and equipment items shall include manufacturer's name and catalog numbers, dimensions, capacities, and all other characteristics and accessories as listed in the specifications or on the drawings.
 6. Submit copies of forms to be used for testing and verification showing all data which is to be recorded. Three copies of complete report shall be submitted for review.
- D. Utility Interfacing: Coordinate interface, via equipment modem and District Ethernet connections furnished by Supplier to Owner's dedicated telephone line or Ethernet network. The DDC/EMS Contractor shall interface with the PG&E electric meter to allow DDC/EMS monitoring and logging of electricity usage, and pay any costs to the utility for such as to comply with PG&E installation requirements.
- E. Installation and Operation Manuals: Furnish Installation and Operating Manuals for all components. These manuals shall contain full documentation which shall include, without being limited to, the following:
1. General description and specifications.
 2. Installation and initial checkout procedures.
 3. Principles and theory of operation.
 4. Complete trouble-shooting procedures and diagrams.
 5. Complete alignment and calibration procedures for all components.
 6. Program source file on CD or 3-1/2" disk (ASCII text file) and hard copy.
 7. Detailed schematics and assembly drawings.
 8. Complete recommended spare parts lists including unit prices.

1.3 SYSTEM ARCHITECTURE

- A. DDC/EMS Equipment: The main controller shall contain the network communications and information management programs providing integrated global control, trend logging, local and remote alarming and fully menu driven user interface. It may be equipped with at least 64 local controllers on each network. The local controller is an intelligent, stand-alone microprocessor-based controller which can have a variety of configurations based on their application.
- B. Campus-Wide Data Transfer System: The DDC/EMS shop drawings shall indicate where all equipment items are to be located for input and output to complete the system. The conduit/cabling system shall inter-tie these points as required to complete one system to meet the design criteria herein. System high speed communication (LAN) shall be hardwired using a Belden shielded cable as recommended by DDC manufacturer and shall communicate at 10M baud with peer to peer communication. System communication between master controller and local controllers (field bus) shall be at 19.2K baud minimum with a two wire shielded RS-485 cable. See Drawings for exterior lighting circuits to be controlled by contactors at panels.
- C. User Interface Communication: The user may communicate with the DDC/EMS system with a workstation located at the District Office over the WAN, with a remote workstation via a telephone modem, with an On-Campus Operator Workstation, and with a Lap-Top computer (Service Tool). The system shall be configured to allow the Service Tool to access data and program any controller on the system from any room sensor service port. Alternatively, a conveniently located service port shall be provided in each building that allows access to data and programming of any controller on the system, if the room sensor service port is limited to only the controller to which the sensor is connected.
- D. Standard Network Support: All Master Controllers, Workstation(s) and File Server shall be capable of residing directly on the owner's Ethernet TCP/IP LAN/WAN. Furthermore, the Master Controllers, Workstation(s) and File Server shall be capable of using standard, commercially available, off-the-shelf Ethernet infrastructure components such as routers, switches and hubs. With this design the owner may utilize the investment of an existing or new enterprise network or structured cabling system. This also allows the option of the maintenance of the LAN/WAN to be

performed by the owner's Information Systems Department as all devices utilize standard TCP/IP components.

PART 2 PRODUCTS

2.1 GENERAL:

- A. The Electronic Microprocessor Based Direct Digital Control and Energy Management System (DDC/EMS) shall monitor the data environment and perform control functions in relation to a programmed strategy and the status of the data environment. The system shall use solid state computer based digital and analog technology. The system shall be standard with the manufacturer to insure ongoing parts availability and trained technical support. The DDC/EMS shall be of the user programmable type requiring no special computer education for operation. All necessary instruction manuals and user orientation training shall be supplied by the manufacturer or agent thereof. The DDC/EMS shall be UL listed as a Direct Digital Control and Energy Management System. The programmable control requirements of the DDC/EMS shall include, but not be limited to:

OPTIMUM START/STOP (BASED ON HISTORICAL DATA)
TIME OF DAY ROUTINES
SCHEDULED OCCUPANCY ROUTINES INCLUDING HOLIDAYS
CUSTOM TAILORED REPORTING
ACCUMULATING RUN TIME
CRITICAL CONDITION ALARMING
FLUID FLOW SWITCH AND CONTROL ALARMING
PID CONTROL ON ANALOG OUTPUTS
HOT WATER RESET
DAY/NIGHT SETBACK
ECONOMIZER/PURGE
CUSTOM TAILORED REPORTING
ACCUMULATING RUN TIME
SEPARATE MODES AS REQUIRED BY CONTROL SEQUENCE

- B. Environment: The DDC/EMS shall operate in an environment of 40 120 degrees F and 10 95% relative humidity. Sensors and control elements shall operate under the temperature, pressure, humidity, and vibration conditions normally encountered in the installed location. The DDC/EMS shall maintain accuracy as follows:
1. +/- 0.5 F for the space temperatures in the 0 F 130 F range.
 2. +/- 0.5 F for duct temperatures in the 40 F 130 F range.
 3. +/- 1.0 F for outside air temperatures in the 30 230 F range.
 4. +/- 1.0 F for water temperature in the 30 230 F range.
 5. KWH and KW monitoring within 1.0%.
- C. Battery Backup: The system shall be tolerant of power failure and hold memory for a minimum of 12 hours. On power restoration, the system shall automatically and without operator intervention of execution of manual restart procedures:
1. Come On Line.
 2. Update all monitored functions.
 3. Resume operation based on current time and status.
 4. Implement special building start up strategies as required.
 5. Log time of power outages and start ups.
- D. Program Storage: The system shall also be capable of interfacing with a mass storage (tape or disc) device, for use in uploading and downloading programs to the DDC/EMS.
- E. Protocol: Protocol shall be BACnet.

2.2 SYSTEMS DESCRIPTION:

- A. Modular Design/Expandability: The DDC/EMS shall be of a modular design providing distributed processing capability, and allowing future expansion of both input/output points and processing/control functions. System size shall be expandable from 4 input points and 4 output points to unlimited. Expansion shall be in modules. The modular DDC/EMS shall be configured on the main/local concept. The main controller shall have the capability of adding local controllers and the local controllers shall be capable of adding I/O modules.
- B. Main (Master) Description: The master shall function as the overall system coordinator, accept control programs, perform automated energy management functions, control peripheral devices and perform all necessary mathematical calculations. The master shall be a microcomputer of modular design. The word size shall be 16 bits or larger, with a memory cycle time less than 1 microsecond. All chips shall be second sourced. The master shall have the following:
1. Protected Access: Key lock protected access to output override switches and internal circuitry.
 2. Memory: The master shall have at least 2 MB of user available memory, in addition to memory required for systems operation and diagnostics or MCP software. Minimum requirements for system operation are as follows: A minimum of 4MB of RAM shall be provided for masters with expansion up to 8MB. The 8MB versions shall include a floating-point math co-processor.
 3. Real Time Clock: The master shall have a battery backed uninterruptable "Real Time Clock". The accuracy shall be within ten seconds per day. The RTC shall provide the following information: Time of Day, Day, Month, Year, and Day of Week. The system shall be programmed to automatically correct the clock for day light savings time and leap years.
 4. Power: The master shall operate from 120 VAC +/- 20%, 60 Hz. Line voltages below the operating range of the system shall be considered outages. The master shall have over voltage surge protection, and require no additional AC power signal conditioning.
 5. Parallel Processing: The master shall be capable of parallel processing, executing separate control programs simultaneously. Any control program may affect control of another program if desired. Each program shall have full access to all I/O facilities of the processors.
 6. Communications Processor: Each master shall provide communication to both the Workstation(s) (LAN) and the field buses (RS-485). In addition, each master must have at least 3 other communications ports that support a telephone modem, portable service tool, serial printer and connection to third party controllers such as a chiller control panel or Variable Frequency Drives. On a LAN/WAN system the master(s) shall be provided with a 10Mbps plug-in Ethernet TCP/IP network interface card (NIC).
 7. Uninterruptable Functions: Control functions shall not be interrupted due to program entry or other user communications.
- C. Local Controller Units: The local units function as a stand-alone controller and as an Input/Output interface of the DDC/EMS and the Data Environment.
1. Monitoring: Local units shall be used to connect the data environment to the system and contain all necessary Input/Output functions to read field sensors and operate controlled equipment based on internal instructions or instructions from the Master. The units shall be fully supervised to detect failures. The units shall report the status of all points in its data environment at the rate of at least once every second. Local units shall connect directly to the Master with a twisted pair shielded RS-485 interface. All local units can run independently in the event of a central unit failure.
 2. Unit Failure: Upon failure of the unit (including transmission failure), the unit shall automatically fail off or to a predetermined state for three-way valves. A message shall be transmitted by the unit indicating a local unit failure.
 3. Power: The unit shall operate from 120 VAC, +/-20%, 60 Hz, 220 VAC, +/-20%, 50 Hz or 24 VAC +/- 20%, 50/60 Hz power. For voltages below the operating threshold the unit shall totally shutdown and de energize its outputs.

4. LAN and/or Field Bus: Each unit shall communicate with any unit through the RS-485 interface LAN and/or field bus.
5. Auxiliary Port: Each unit shall be equipped with an auxiliary port to allow local interrogation of input and output values, and keyboard override of outputs through laptop.

2.3 INPUT/OUTPUT CAPABILITY:

- A. Inputs: The DDC/EMS shall accept information in the form of a temperature, voltage, digital signal (on off) or pulse counter.
 1. Analog Inputs: The Analog Input (AI) function shall monitor each analog input, perform A/D conversion, and hold the digital value in a buffer for interrogation. The A/D conversion shall have a minimum resolution of 10 bits. Input ranges shall be within the range of 0 10 VDC.
 2. Digital Inputs: The Digital Input (DI) function shall accept dry contact closures and voltage level or resistance level (5VDC reference voltage) transitions. A voltage level below 1 volt or a resistance below 500 ohms shall be read as ON (closed), a voltage level above 3 volts or a resistance above 1400 ohms shall be read as OFF (open).
 3. Pulse Accumulator Inputs: The pulse accumulator function shall have the same characteristics as the DI, except that, in addition, a buffer shall be included to totalize pulses between interrogations. Each input shall accept pulses at a minimum of 2 per second.
 4. Temperature Inputs: Temperature inputs originating from a thermistor shall be monitored and buffered as an AI, except that, automatic conversion to degrees F shall occur without any additional signal conditioning.
 5. Input Wiring: All analog inputs shall be two wire devices, with shielded wire for accurate operation.
- B. Outputs:
 1. Master and local controllers - Form C relay outputs rated at 5 amp, 24 VAC/DC or 2 amp, 30 VAC for on/off or Pulse Width Modulation for maintained operation of field devices. Output pulse width shall be selectable between 0.1 and 3200 seconds with a minimum resolution of 0.1 seconds. Isolation and protection against voltage surges shall be provided. Central plant controllers shall be equipped with an ON/OFF/AUTO switch to manually obtain either output state. Manual overrides shall be reported to the master at each update. An LED shall be provided to indicate the state of each digital output.

2.4 SOFTWARE:

- C. User Software: Provide software for On-Campus workstation, Laptop Computer (Service Tool) and District office workstation (required upgrades and programming only if software is already existing on District office workstation).
- D. Software Features:
 1. Mathematical Requirements: The DDC/EMS shall have a math package capable of addition, subtraction, multiplication, division, square root, greater than and less than functions, minimum and maximum selection functions, and up to five levels of parenthesis for computation of variables. Control commands may be executed based on these calculated variables which are available to the program on a global basis. Math expressions may be used in action and exit commands of control program. The mathematical software shall be capable of mixed mode arithmetic, utilizing Boolean logic statements in combination with basic arithmetic to provide conditional mathematical computations.
 2. Passwords: The DDC/EMS shall have multiple levels of user programmable passwords in addition to a master password, for programming security. Separate passwords may be user programmed. Level of password will define user's access level and ability to change system.

3. Trend Logging: The DDC/EMS shall trend log variables. Any system variable (inputs, outputs, numerals, can be trend logged.
 4. Messages: The DDC/EMS shall provide alarming, preventative maintenance and status reporting messages.
 5. Look Up Tables: The DDC/EMS shall have preprogrammed "LOOK UP" tables for the conversion of voltage inputs into dew point temperature and water vapor pressure values for the computation of relative humidity and enthalpy.
 6. Documentation Format: The programming language of the DDC/EMS shall be plain English based such that a printout of the control program shall serve as the primary documentation for the system.
 7. Micro Processor Integrity Checking: Each DDC/EMS microprocessor shall continuously monitor and check itself and produce error messages in the event of a malfunction.
 8. Data Plotting: The DDC/EMS shall provide plots of values of system variables on a graph. Graphs may consist of combinations of up to 3 system variables at a time from the history logs.
- E. Color Graphics Requirements Provide color graphics which allow user to access and change (based on user access level) all schedules and setpoints (including damper or control valve positions) directly through the user graphics. Real time data shall continuously be updated. Navigation between the screens (forward and backwards) shall be accomplished with the use of a mouse. The minimum graphic screens shall include the following:
1. Site lay-out locations of all equipment being controlled, control component locations, and spaces served. Provide multiple screens-minimum of 1 screen per building plus site and others as needed for clarity. By "clicking" mouse on the desired equipment area a flow diagram will be displayed for the related equipment (as described below - Item 2). By "clicking" the mouse on a conditioned space, a graphic display of the zone conditions (as described below - Item 3) will be displayed.
 2. Flow diagrams shall be provided for each HVAC system, such as air-handling system, chilled water system, hot water system, condenser water system, package unit system, brine system with all inputs and outputs dynamically displayed.
 3. Each temperature control zone shall have a screen providing set points, temperatures, and related HVAC system status data.
 4. Scheduling screens allowing On/Off times to be set for all of the following:
 - a. Pre-determined individual days
 - b. Pre-determined blocks of days (From/To)
 - c. Schedules for "Routine" school sessions
 - d. Schedules for "Special" school sessions
- F. Software Manual: The software manual shall describe programming and testing, starting with a system overview and proceeding to a detailed description of each software feature. The manual shall instruct the user on programming or reprogramming any portion of the system. This shall include all control programs, variables, set points, time periods, messages, passwords and other information necessary to load, alter, test and execute the system. The manual shall include commands, editing and writing control programs, printouts and logs, mathematical calculations, and instructions on modifying any control point, verifying error status, changing passwords, and initiating or disabling control programs.
- G. Software Licenses: The owner shall be named the license holder of all software associated with any and all incremental work on the project(s). Owner shall receive ownership of all job-specific software configuration documentation, data files, and application-level software developed for this project. This shall include all custom, job-specific software code and documentation for all configuration and programming that is generated, and any related LAN/WAN/Intranet and Internet connected routers and devices. Any and all required IDs and passwords for access to any component or software program shall be provided to the Owner.

2.5 USER INTERFACE:

- A. Character Code: Communication with the DDC/EMS shall be ASCII format, or manufacturer's management communication program.
- B. External Communication Interface: In addition to the LAN/WAN communication capabilities specified in paragraph 1.3, C, each master unit shall communicate through an EIA RS232C serial port. Communication may be accomplished with any RS232C compatible terminal. Baud rate shall be selectable from 300 to 19.2 baud. The master shall also provide a spare RS232C serial port for communication to an alarm printer. The software shall provide the ability to direct alarm messages and text reports to either the District workstation and On-site workstation via the LAN/WAN, the spare port or the primary communication port based on time of day, type of alarm, etc.
- C. Direct Computer Communication: The DDC/EMS shall have a computer compatible communication mode for communication with other intelligent devices, which performs data integrity checking, with automatic retransmission of data when errors are detected.
- D. On-Campus Operator Workstation: Hardware shall be furnished by District. Install DDC/EMS software on workstation, and furnish Software license for workstation to District. Coordinate hardware requirements with District.
- E. Laptop Computer (Service Tool): Hardware shall be furnished by District. Install DDC/EMS software on laptop, and furnish Software license for workstation to District. Coordinate hardware requirements with District.

2.6 SYSTEM COMPONENTS:

- A. Control Components:
 - 1. Wall Switches: Plates for all wall switches and timers shall match those specified in Division 26.
 - 2. Labels: All labels, signs, etc. shall be engraved, laminated plastic, white on black background, 1/8" high lettering, minimum.
 - 3. Temperature Sensors:
 - a. Sensor Type: All temperature sensors shall be made of a highly stable, precision thermistor material accurate to within +/- 0.36 Degrees F. Identify each temperature sensor with a "Lamicoid" label keyed to the control system as-built drawings.
 - b. Room Sensor: Room temperature sensor shall have Executive Decorator housing with programmable visible temperature indication. Housing shall include an occupancy override, temperature setpoint adjustment and a service tool jack. Units as detailed on drawings shall have integral CO2 sensor similar to '4' below.
 - c. Vandal Resistant Room Sensor: Where noted, shall be a blank stainless steel wall plate with the sensing element bonded to the back side. The plate back shall be insulated to reduce wall temperature influence.
 - d. Duct Sensor: Duct temperature sensor shall be a probe type element with 9 inch insertion length. Element shall be installed where air mixture provides a true temperature indication. Where adequate mixing is not practical, the duct temperature sensor shall have an averaging type thermistor element, installed across the entire cross section of the duct.
 - e. Outdoor Air Sensor: Outdoor air temperature sensor shall be a probe type element mounted in a ventilated, treated white PVC sun shield to minimize radiant energy effects. The sensor and sun shield shall be mounted on a weatherproof outlet box for outdoor installation.
 - f. Low Differential Air Pressure Applications (0" to 5" W.C.): The differential pressure transmitter shall be of industrial quality and transmit a linear, 4 to 20

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mA output in response to variation of differential pressure or air pressure sensing points. Non-interactive zero and span adjustments, adjustable from the outside cover. (0.00 - 1.00" to 5.00") W.C. input differential pressure ranges. 4-20 mA output. Maintain accuracy up to 20 to 1 ratio turndown. Reference Accuracy: +0.2% of full span.

4. Carbon Dioxide Sensor: Wall mounted CO₂ sensor, specially designed for demand controlled ventilation. Non-dispersive IR (NDIR) sensor. Five-year recommended calibration interval. Push-button calibration. Features as specified below. Kele KCD Series.
 - a. Range: 0-2000 ppm CO₂
 - b. Accuracy +/- 3% of reading or ±40 ppm
 - c. Response time: < 1 min.
 - d. Output signal: 0-10 VDC or 4-20 mA (500 ohm max) depending on model
 - e. Power supply: Nominal 24 VAC/DC
 - f. Warm-up time: 3 min.
 - g. Operating temp: 32° to 122°F (0° to 50°C)
 - h. Operating humidity: 0% to 95% RH (noncondensing)
 5. Temperature Control Panels: Each panel and each control device or readout on the front of the panel shall be identified with a laminated plastic label with 1/4" high engraved lettering, white on black background. Pilot lights shall be the push to test type.
 6. Smoke Detectors: Furnished and installed by Division 26. Power and fire alarm wiring by Division 28. Control wiring by Division 23. Coordinate with Division 26.
 7. Status Sensor: Current sensing status sensor (with sensitivity adjustment for belt loss detection).
 8. Electric Actuators:
 - a. General: Fully modulating, UL listed. Visual position indicator, manual override and clear weather shield where exposed to weather. 24 volt. Belimo.
 - b. Valve Actuators: Provide with factory mounting brackets and linkage to the control valve. Capable of shutting off against a 50 psi differential.
 - c. Damper Actuators: Positive position feedback and spring return. OSA dampers shall be spring return closed. Actuators shall be direct mounted onto the damper control shaft without linkage. Damper actuators shall be sized to provide a minimum of 5 in-lbs torque per square foot of damper face area.
- B. Lighting Contactors: Lighting contactor with metal enclosure will be furnished, installed, and wired to the lighting panel by the electrical contractor. See electrical contract documents for location. The DDC/EMS Contractor shall provide low voltage relay(s) required at the contactor panel and wire to the contactors to complete the DDC/EMS side of the lighting control. DDC/EMS Contractor shall provide required photo cells. Relays shall be suitable for up to 277 volts.
- C. Lightning Arrestor and Surge Suppressors: Shall be provided as approved and/or manufactured by the DDC/EMS equipment manufacturer.
- D. Conduit: Conduit to be a minimum 1" diameter, and to have at least 25% spare capacity, except drops to room sensors may be run in 1/2" conduit. Conduit shall be run in electrical or mechanical trenches wherever possible. Site conduit (building to building) will be installed (and terminated inside the building) by Division 26.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION:

- A. General: 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.

- B. Labeling of System: DDC/EMS Contractor shall provide complete labeling of all terminals at all panels or equipment terminal strips and wiring. Equal to Brady marking on wires and number on terminals in sequence corresponding to control diagram.
- C. Programming:
1. The Direct Digital Control and Energy Management System (DDC/EMS) operational program shall be provided by the DDC/EMS Contractor. The DDC/EMS Contractor shall be responsible for programming the system and shall coordinate the scheduling (on/off times) with the Owner. Prior to start-up, the DDC/EMS Contractor shall provide any testing program he feels necessary to fully test the operation of the various components.
 2. The DDC/EMS Contractor shall load the operational program into the DDC/EMS controller from his office via the system's modem or at the job site via a direct connect cable. Prior to starting up the system, the DDC/EMS Contractor shall:
 - a. Confirm that the control system has been connected to the District's LAN/WAN, a dedicated telephone line, and that the LAN/Wan and the phone line and system modem is working.
 - b. Confirm the functionality of the DDC/EMS controllers and all input points by reading the input values, and comparing them with a measured temperature, pressure, voltage, current, or resistance as appropriate. Calibrate all transducers as required.
 - c. Confirm the functionality of all digital output points by manual operational of the relay contacts. Use proper discretion in starting and stopping equipment.
 - d. Confirm the functionality of all analog output points by manually imposing an adjustable voltage on the appropriate circuit to check proper operation of the controlled device. Calibrate all transducers as required.
 - e. The DDC/EMS Contractor shall notify the General Contractor (one week in advance of) when the system will be ready for loading and testing the operational program. The DDC/EMS Contractor's start-up technician shall be present while the program is being loaded and shall communicate with the programmer prior and after program loading to confirm proper operation.
- D. Training: Prior to final acceptance, the DDC/EMS Contractor shall provide operational training to the Owner's personnel. The training sessions shall include a complete demonstration of the system. Dates and times of the training sessions shall be coordinated through the Owner not less than one week prior to session. A total of 40 hours of instruction shall be provided - 24 hours initially, and 16 hours to be spread throughout the first year of operation. The DDC/EMS Contractor shall maintain a log of training sessions including dates, times and names/titles of those attending. The DDC/EMS Contractor shall submit a copy of this log on request.
- E. Testing and Acceptance: The DDC/EMS Contractor shall furnish a complete and operating system. The DDC/EMS Contractor shall also verify, in the presence of the Owner, the system accuracy and proper function of each controlled device and sensor. The following items shall be successfully demonstrated prior to acceptance by the Owner:
1. All system outputs including controllers, relays, and other control devices shall be addressed and start/stop functions demonstrated.
 2. All inputs shall be displayed and all event-initiated functions shall be demonstrated.
 3. Demonstrate program integrity and power restore sequence during and after a power failure and restoration.
 4. Deliver all Record Drawings, wiring diagrams, equipment specifications, installation and Operation Manuals and other documentation as required to describe the system.

5. Complete operator training in the use, programming, and operation of the system.
- F. Start-up of the System:
1. The start-up period starts when the following conditions are met:
 - a. The DDC/EMS system and all involved HVAC equipment have been installed, connected to the DDC/EMS system and are ready to operate.
 - b. A start-up meeting has been conducted with representative of the General Contractor, Architect/Engineer, maintenance staff, and the DDC/EMS Contractor.
 - c. Consensus is reached, by the representatives at the above referenced meeting that it is appropriate for the start-up process to start.
 2. The alarm pagers called by the control system during the start-up period shall be the pagers carried by the Mechanical Contractor and/or DDC/EMS Contractor as appropriate. The Mechanical Contractor and DDC/EMS Contractor shall respond to all pages from the control system and work cooperatively to insure that the building environmental standards are maintained.
 3. The start-up process shall be completed and the warranty period shall start when the following conditions are met.
 - a. All training to be provided as part of the project has been completed.
 - b. No "alarm" or "condition reports" are being generated by the DDC/EMS system for seven (7) calendar days (168 hours) due to incomplete or inaccurate installation or programming.
 - c. All adjustments and "fine tuning" of the system have been completed.
 - d. The phone numbers for the pagers and alarm printer are programmed.
- G. Verification: A written testing and start-up report must be submitted for approval before acceptance. In addition to the DDC/EMS Contractor's testing and start-up report, the Owner may independently verify the test results. The report on test results shall include setpoints and operating ranges of all components.

3.2 SEQUENCE OF OPERATION:

- A. Dedicate Outside Air Unit (OSA-1): (Heating setpoint 72°F, Cooling setpoint 75°F) The unit shall run per the system operation schedule through the DDC/EMS. Room temperature sensor shall be wall mounted. If the bypass button on the room temperature sensor is activated, the heating/cooling unit shall start for two hours (adj.). The unit setpoint shall be adjustable $\pm 2^\circ\text{F}$ (adj.) from a switch located on the temperature sensor. Unit fan shall run continuously on start by the DDC/EMS. DDC/EMS shall control the heating/cooling unit to maintain setpoints. On call for cooling, the DDC/EMS shall start the unit cooling at 2°F (adj.) above cooling setpoint and run to 2°F (adj.) below setpoint for cooling and then stop the unit cooling. On call for heating, the DDC/EMS shall start the unit heating at 2°F (adj.) below heating setpoint and run to 2°F (adj.) above setpoint for heating and then stop the unit heating. The unit shall be 100% outside air. The DDC/EMS shall monitor the unit status with a current sensor and the supply air temperature. A factory furnished static pressure sensor shall be installed in the ceiling to control the power exhauster to maintain a 0.01" W.C. (adj.) setpoint when unit is in economizer operation. Provide a co-axial cable switch plate cover for mounting the room pressure sensing port. See Drawings Sheet M4.01, M4.02, M4.03, M4.04 for additional control. Interface factory BACnet controller with DDC/EMS.
- B. Kitchen Hood Exhaust Fan (EF-1): See Drawings Sheet M4.01, M4.02, M4.03, M4.04 for control. Interface factory BACnet controller with DDC/EMS.
- C. Exhaust Fan (EF-2 thru EF--6): DDC/EMS shall start/stop fan per schedule by Owner, unless noted otherwise on equipment schedule. A current sensor shall monitor fan status to the DDC/EMS. If the exhaust fan is to be running and the current sensor indicates that the fan is not running, the DDC/EMS shall signal an exhaust fan failure.

- D. Domestic Hot Water Circulating Pumps: DDC/EMS shall start/stop all domestic hot water circulating pumps on a schedule established by the Owner. DDC/EMS shall monitor status of each pump with a current sensor.
- E. Outside Lighting: Outside lighting points currently controlled by DDC/EMS shall remain. Provide additional points, if required by the Electrical Drawings. Coordinate with Division 26.
- F. Central Plant Equipment: The campus circulation pumps shall be started/stopped by the BAS or manually. The pump speed shall be modulated to maintain a minimum pressure as reported by the pressure transmitters. The lead pump shall be cycled to 80% of capacity. When the system demand exceeds this set point the lag pump shall be started and the two pumps track in unison to maintain system pressure. Ramp down sequence shall be in reverse order. The lead/lag pumps shall be alternated on a run time basis (adjustable) by the BAS, or by manual selector switch. Pressure transmitters shall be located as shown on the plans. At the differential pressure sensor locations for the chilled and hot water piping, provide an engraved plastic tag indicating "PRESSURE SENSOR". On the pressure sensor, provide a brass tag indicating "PRESSURE SENSOR FOR DISTRIBUTION PUMP CONTROL".
1. Boiler: The boiler pump and boiler are started by a signal from the BAS and operate continually until BAS shut-down by either time schedule or by outside air temperature rise to 65 degrees F (adjustable). Boiler pump shall continue to run for 15 minutes (adjustable) after boiler shut down.
 2. The boiler shall be interlocked with a flow switch to insure flow. The boiler temperature is controlled by the boiler thermostat.
 3. A 2-way isolation valve in the boiler inlet shall be interlocked with the boiler. It shall be closed when the boiler is off.
 4. Heating hot water reset control: (Initial set point 150°F). Main loop water temperature shall be BAS controlled. The main loop reset temperatures as controlled by BAS shall be adjustable. The BAS shall check the opening positions of all hot water control valves every 10 minutes (adj.). When any valve opens to 95% of maximum, the loop temperature shall reset to 2°F above previous set point. The maximum set point is 150°F (adj.). If any hot water control valve on the system with the greatest opening position below 85% (adj.) of maximum opening, the loop temperature shall reset to 2°F below the previous set point. The minimum set point is 120°F (adj.)
 5. Chiller: Chiller and pumps are started by BAS and upon proof of evaporator and condenser flow the chiller is allowed to operate on its internal controls to maintain chilled water temperature. Provide control boards, wiring and programming for the chiller to allow the Owner maintenance and EMS departments to monitor the chiller operations through the micro-processor that is built into the chiller. Provide front end control boards and dedicated communication/control wiring as required.
 6. The chilled water pump starts by BAS signal and operates continually until BAS shut down. Chilled water pump to run for 15 minutes (adjustable) after chiller shut down.
 7. Cooling chilled water reset control: (Initial set point 44°F). Main loop water temperature shall be BAS controlled. The main loop reset temperatures as controlled by BAS shall be adjustable. The BAS shall check the opening positions of all chilled water control valves on the system every 10 minutes (adj.). When any valve opens to 95% of maximum, the loop temperature shall reset to 1°F below previous set point. The minimum set point is 44°F (adj.). If the coil control valve on the system the greatest opening position is below 85% (adj.) of maximum opening, the loop temperature shall reset to 1°F above the previous set point. The maximum set point is 50°F (adj.)
- G. Air Handler - VAV:
1. General: The unit shall be activated by the BAS. The unit shall be capable of an economizer cycle. A static pressure sensor located 2/3 of the distance down the supply ductwork shall cause the VFD to vary the air volume of the supply fan to maintain a constant duct pressure. A static pressure sensor located in the return ductwork 2/3 of the distance from the most remote return grille towards the return/exhaust fan shall cause the

- VFD to vary the air volume of the return/exhaust fan to maintain a constant return duct pressure.
2. **Minimum Outside Air Control:** The DDC shall modulate the outside air and relief dampers to maintain the required minimum outside air (except in economizer mode), proportional to the signal used to control the supply fan speed. The outside air damper positions shall be developed in coordination with the Balancing Contractor. One set point shall be with the supply fan VFD setting for maximum scheduled air flow. The outside air dampers shall be adjusted to provide the minimum scheduled air flow with the VFD at this position. The second set point shall be with the supply fan VFD setting for minimum scheduled air flow (30% of maximum air flow). The outside air dampers shall be adjusted to provide the required minimum air flow with the VFD at this position. The relief dampers shall also be set using this procedure. See notes at drawing schedule regarding demand control ventilation with CO2 sensors.
 3. **Heating:** (Initial leaving air temperature set point 85°F) On system startup, if the temperature sensors for all VAV/VVH boxes on an air conditioning system call for heating, the outside air (OSA) damper is closed, the relief damper is closed and the control valve is fully open. All VAV/VVH boxes shall be fully open. As the space temperature approaches set point, the OSA and relief dampers open and modulate to provide minimum outside air. Signals from the VAV/VVH box temperature sensors shall be able to reset the leaving air temperature set point. The DDC/EMS shall check the air flow of all VAV/VVH boxes on the system every 10 minutes (adj.). When any box air flow is above 95% (adj.) of maximum position the air handler leaving air set point shall be reset to 1°F above the previous set point. The maximum leaving air temperature is 85°F (adj.). If the VAV/VVH box on the system with the greatest air flow is below 85% (adj.) of the maximum air flow, the leaving air set point shall reset to 1°F below the previous set point. The minimum leaving air temperature is 75°F (adj.).
 4. **Cooling and Ventilation:** (Initial leaving air temperature set point 55°F) A temperature sensor downstream of the cooling coil shall modulate the system to maintain a downstream supply air temperature of 55°F (adj.). The first source of cooling is the outside air in Economizer mode. When the outside air temperature is below 55°F, the outside air damper shall modulate to maintain set point. When the outside air temperature is 55°F to 75°F, the outside air shall open fully, and the cooling coil control valve modulates to maintain set point. When the outside air is above 75°F then the outside air damper closes to minimum position, and the control valve shall modulate to maintain set point. The DDC/EMS shall check the air flow of all VAV/VVH boxes on the system every 10 minutes (adj.). When any VAV/VVH box air flow is above 95% (adj.) of maximum position the air handler leaving air set point shall be reset to 1°F below the previous set point. The minimum leaving air temperature is 55°F (adj.). If the VAV/VVH box on the system with the greatest air flow is below 85% (adj.) of the maximum air flow, the leaving air set point shall reset to 1°F above the previous set point. The maximum leaving air temperature is 65°F (adj.).
 5. **Purge Cycle:** At 4:00 a.m. during the cooling season between April 15 and October 15, if the room temperature exceeds the outside air temperature, the unit shall run with the outside air and relief dampers 100% open. The unit shall stop and the OSA and relief dampers shall close when the room temperature is within 2 degrees of the OSA temperature.
 6. **Off Cycle:** The outside air and relief dampers go to the closed position and the fans shut off.
 7. **Variable Air Volume Box (VAV):** (Cooling set point 74°F, Heating set point 71°F). Each variable air volume box shall be controlled by a wall mounted temperature sensor through the DDC. The air volume shall increase as the demand for cooling increases. All air volumes and temperature set points shall be adjustable through the DDC. The cross flow sensor shall be furnished and installed by the box manufacturer. The box shall open fully if the supply air temperature is greater than 80°F. Provide additional status for supply duct temperature and static pressure.
 8. **Variable Air Volume Box with Heating Coil (VVH):** Same as VAV above, except as follows. On a call for full heating, the VVH boxes open to full air flow and the hot water

valve is fully open. As the demand for heat decreases the hot water valve modulates toward the closed position. The hot water valve shall fail in the closed position. Provide additional status for hot water valve position.

- H. Air Handler – Single Zone: Same as Air Handler – VAV, except no VAV functions.

END OF SECTION

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PART 1 – GENERAL

1.01 RELATED DOCUMENTS

All work under Divisions 26, 27, and 28 is subject to the General, Supplementary, Special Conditions and other Division 1 Specification Sections preceding this section. The Contractor will be responsible for and governed by all requirements. Drawings indicate the general arrangement of the electrical layout and work included. The Contractor will follow these drawings to lay out and check the drawings of other trades to verify locations and spaces in which work will be installed.

1.02 SUMMARY OF WORK

- A. This portion of the work includes furnishing of all labor and materials necessary for a complete wiring system to outlets and all equipment shown on the Drawings or covered by this section of the Specifications. In general, the work includes the following:
1. Power service and distribution system as shown, complete with panelboards and feeders.
 2. Complete system of branch circuit wiring and equipment including all wiring devices and plates on all outlets.
 3. A new lighting fixture system complete with lighting controls, as shown on Plans, including factory commissioning and acceptance testing.
 4. Data, VoIP, Security, Access, and Fire alarm system, conductors, cabling, outlets, and equipment, for complete working systems
 5. Raceways, wiring, fused disconnect switches, etc., for equipment covered by other sections of these Specifications.
 6. All hangers, anchors, sleeves, chases, and supports for fixtures, electrical equipment and materials including earthquake bracing.
 7. All disconnection and removal of any existing electrical facilities not to be reused or noted to be demolished.
- B. The electrical drawings are diagrammatic and do not necessarily show all raceway, wiring, number or types of fittings, offsets, bends or exact locations of items required by the electrical systems. Items not shown or indicated which are clearly necessary for proper operation, payment or installation of systems shown shall be provided at no-increase in contract price.

- C. The exact routing of systems and location of devices and equipment shall be governed by coordination with other trades, structural and architectural conditions. The Architect or Electrical Engineer reserves the right, at no increase in contract price, to make reasonable changes in location of electrical equipment or wiring systems; so as to coordinate with other systems, group them into orderly relationships, or to increase their utility. Contractor shall verify requirements in this regard prior to roughing in.
- D. Install electrical work in cooperation with other trades and make proper provisions to avoid interferences and coordinate with structural and architectural features, in a manner approved by the Architect or Electrical Engineer. All changes caused by neglect to make such provisions shall be at Contractor's expense. Provide offsets and special fittings, as required to facilitate installation of the work.
- E. When a particular product or type of product is specified with a manufacturer's designation, the latest published specifications, installation, and construction information of the manufacturer shall constitute the minimum acceptable standard. Any substitutions shall be made in accordance with the SUBSTITUTIONS sections of the Specifications.

1.04 RULES AND REGULATIONS

- A. All work and materials shall be in full accordance with the latest rules and regulations of the following:
 - 1. California Electrical Code (CEC), 2022 Edition
 - 2. California Energy Commission, Title 24, 2022 Standards
 - 3. California Fire Code, 2022 Editions
 - 4. National Fire Alarm and Signaling Code NFPA 72, 2022 Edition
 - 5. California Building, Mechanical and Plumbing Codes, 2022 Editions
 - 6. California Code of Regulations
 - a. Title 8, Safety Orders
 - b. Title 19, Fire and Panic Safety Standard
 - c. Title 24, Part 1, Administrative Regulations
 - 7. Occupational Health and Safety Act (OSHA)
 - 8. California State Fire Marshal Rules
- B. Where two or more codes conflict, the most restrictive shall apply.

- C. Nothing in these Plans and Specifications is to be construed to permit work not conforming to these codes.
- D. Before the Final Certificate of Payment will be issued, the Contractor shall deliver to the Owner all Certificates, Permits, Record Drawings and Instructions/Parts Manuals.

1.05 TESTS AND STANDARDS

- A. The tests, standards, or recommended procedures of the following agencies shall relate to all parts of these Specifications and shall be considered a minimum:
 - 1. American National Standards Institute (ANSI).
 - 2. Underwriters Laboratories, Inc. (UL).
 - 3. National Electric Manufacturers Association (NEMA).
 - 4. Electrical Testing Laboratories (ETL).
 - 5. National Fire Protection Association (NFPA).
 - 6. Insulated Power Cable Engineers Association (IPCEA).
 - 7. Institute of Electrical and Electronic Engineers (IEEE).
 - 8. Illumination Engineering Society (IES).

1.06 EXAMINATION OF DOCUMENTS AND SITE

- A. Before submitting a proposal, each bidder shall carefully examine the electrical, mechanical, architectural, and structural drawings and specifications. He shall also visit the site and fully inform himself as to all existing conditions and limitations applying to the work. If, after such examination and study, it appears that any change from the drawings and specifications should be allowed, the bidder shall so state in writing together with any change in cost involved.
- B. By the act of submitting a proposal, each bidder shall be deemed to have made such examinations of the drawings and specifications and premises, and it will be assumed that he is therefore familiar with the entire scope of the project and has based his proposal upon the work described in the Drawings and Specifications and upon all existing conditions and limitations applying to his work.

1.07 IMPLEMENTATION

- A. Workmanship: The work shall be performed by competent workmen, skilled in the particular phase of the work entailed. The work shall be first class throughout, neat, accurate and in full accordance with the intent of these Specifications and the satisfaction of the Architect or Electrical Engineer.

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- B. Safety: All standard safety procedures as set forth by OSHA, CCR, and California Division of Industrial Safety shall be strictly adhered to.
- C. Coordination: The Contractor shall familiarize himself with the work of other crafts so as to be able to provide electrical service of correct size and voltage and other requirements to any equipment to be installed.
- D. Scheduling: The installations shall be coordinated as to location and time, and interference causing delays and non-acceptable construction shall be avoided. Order equipment in a timely manner to prevent any delays in the construction schedule and he shall bear any penalty by vendors to meet schedules.
- E. Collaboration: Prior to commencing construction the Electrical Contractor shall arrange a conference with the general and sub-contractors as well as equipment suppliers and shall verify types, sizes, locations, requirements, controls, and diagrams of all equipment furnished by them.
- F. Materials: All equipment and materials shall be new, UL (Underwriters Laboratories) approved, and of the best quality. When specific trade names are used in connection with materials they are mentioned as standards but, this implies no right upon the part of the Contractor to substitute other materials or methods without prior approval.
- G. Excavation: The Contractor shall provide all excavating and backfill required for the proper installation of electrical work, whether or not shown on the Drawings or as specified. This shall be done per the EXCAVATION portion of the Specifications.
- H. Cutting and Repairing: The Electrical Contractor shall do all cutting necessary for the proper installation of his work, repair any damage done by himself or his workmen, and coordinate his work with that of others. Do no cutting or patching without approval of the Architect or Electrical Engineer. Round holes through concrete slabs or walls shall be core drilled with a diamond drill, rectangular openings shall be cut with a diamond saw. In no case shall any concrete beam or column be cut.
- I. Sleeves and Openings: Electrical Contractor shall be responsible for all sleeves and openings through walls and floors required by electrical work. All openings around conduits in sleeves shall be sealed with a material of equal fire rating as the surface penetrated. Openings not utilized shall be temporarily sealed in a similar manner. All required sleeves shall be furnished to and coordinated with the General Contractor.
- J. Cleaning and Painting: All exposed work shall be thoroughly cleaned upon completion of work. All panelboards and equipment not located in electrical or mechanical rooms or closets shall be field painted per painting specifications, color as selected by Architect. Panelboard enclosures, fixtures, and equipment, where finish has been marred in shipment or installation, shall be completely refinished. Minor finish damage shall be rectified as indicated by the Architect or Electrical Engineer. Contractor shall remove all waste and rubbish resulting from his work from the site.

- K. Earthquake Restraint: All electrical equipment shall have a means to prohibit excessive motion during an earthquake. Equipment that vibrates during normal operation shall have isolators with mechanical stops. All transformers are considered to vibrate during operation.
- L. Mechanical Equipment and Other Special Equipment:
1. Prior to commencing construction, the Contractor shall arrange a conference with the Mechanical and Plumbing Contractors, and the Equipment Suppliers, to verify type, sizes, locations, requirements, controls and diagrams of all equipment furnished by them. In writing, he shall inform the Electrical Engineer that all phases of coordination of this equipment have been covered. If any unusual conditions or problems arise, they are to be enumerated them at this time.
 2. The Contractor shall furnish all electrical line voltage wiring, fused disconnects and conduits, unless otherwise shown.
 3. The Contractor shall be responsible for electrical hook-up and connection to all electrical equipment furnished by all Contractors of this Project. This includes all mechanical equipment, plumbing equipment, and special equipment furnished by other contractors.
- M. Portable and Detachable Parts: The Contractor shall retain in his possession and shall be responsible for all portable and detachable parts or portions of the installation such as fuses, keys, locks, adapters, locking clips, and inserts until final completion of his work. These parts shall be itemized and delivered to the Owner at Project Closeout.

1.08 QUALITY CONTROL

- A. Supervision: The Contractor shall personally, or through a competent representative, constantly supervise the work from beginning to completion and final acceptance. He shall cooperate fully with the inspection authorities in the provision of information and access to the work. He shall, to the best of his ability, maintain the same job foreman throughout the life of the project unless a replacement is requested or authorized by the Architect or Electrical Engineer.
- B. Inspection and Tests: The Contractor shall furnish all labor and test equipment required to fully test and adjust the equipment installed under this specification and demonstrate its proper operation.
1. Arrange for all tests and inspections and provide minimum 48 hours' notice to the Architect or Electrical Engineer.
 2. A test must demonstrate that each piece of equipment, outlet, fixture, device, and appurtenance is in sound operating condition and in proper cooperative relation to associated equipment.

3. All tests shall be conducted under supervision of the Architect or Electrical Engineer, and any defects of any nature which are apparent as a result of such test shall be made correct to the satisfaction of the Architect or Electrical Engineer before final acceptance is made.
 4. No equipment shall be tested, or operated for any other purpose, such as checking motor rotation, until it has been fully checked in accordance with the manufacturer's instructions.
- C. Warranty: The Contractor agrees to replace or repair, to the satisfaction of the Owner, any part of the installation which may fail due to defective material and/or workmanship or failure to follow Drawings and Specifications, for a period of one year after final acceptance. Any damage to other work resulting from such failure or the correction thereof shall be remedied at the Contractor's expense. The Contractor shall, further, secure from the manufacturers of special equipment, such as signal systems, their respective guarantees and deliver same to Owner. Guarantees between Contractor and his suppliers shall not affect warranties between Contractor and Owner.

1.09 SUBMITTAL

- A. Make submittal for all material to be used on the project, whether as specified or substitutions, within thirty-five (35) days after award of Contract by the Owner, in accordance with Section 01-300, SUBMITTAL, and the following:
1. All submittals shall be neat and bound in a suitable folder or binder.
 2. Identify each item by manufacturer, brand, trade, name, number, size, rating, and whatever other data is necessary to properly identify and check materials and equipment. Words "as specified" are not sufficient identification.
 3. Identify each submittal item by reference to specifications section paragraph in which item is specified, or Drawings and Detail Number.
 4. All submittals shall be submitted in coherent groups; e.g. all light fixtures at one time. No partial, or incomplete submittal will be accepted.
 5. Organize submittal in same sequence as they appear in specification sections, articles, or paragraphs.
- B. Product Data: Submit eight copies, in groups, as follows:
1. Boxes, pullboxes, conduits, and raceway types required, including fittings
 2. Electric Wire, cable, and connectors
 3. Panelboards and disconnects.
 4. Lighting fixtures

5. Wiring Devices
 6. Fire Alarm System
 7. Data, VoIP, and Low Voltage Special Systems
- C. Shop Drawings: Shop drawings shall show physical arrangement, wiring diagram, construction details, finishes, materials used in fabrication, provisions for conduit entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, weight, power sources, circuit numbers, and shall be compatible with the Contract Drawings and Specifications.
- D. Show wiring as actually installed, connected, and identified for this specific project. Include identification of cables and cable conductors.
- E. Shop and instruction drawings shall cover the equipment or device to be installed and not merely the general class of such equipment or device.

1.10 SUBSTITUTIONS

- A. The Specifications or Drawings are in no way to be construed as being proprietary toward one product. Those products, or types of products, listed are intended to set the standard for quality, design, and installation procedure. However, no right is implied upon the part of the Contractor to substitute other materials, products or systems without the written approval of the Architect or Engineer.
- B. All requests for substitution shall be made in accordance with the SUBSTITUTIONS section of the Specifications.
- C. All requests for substitutions shall be in writing, received at least 14 days prior to bid date, and shall indicate all information required thereon including differences from the specified item. The request for substitution shall be accompanied by cuts, product literature, performance data, specifications, drawings, samples or other means as may be required for proper evaluation by the Architect or Electrical Engineer.
- D. All proposed substitutions shall be standard product of the firm under current manufacture and be a catalog item at time of bid.
- E. Acceptance of substitution shall not relieve the Contractor from responsibility for complying with requirements of the Contract Documents. The Contractor shall be responsible for changes in other parts of the work occasioned by his substitutions and shall bear their expense.
- F. Representative samples may be required for determination of equality. It is understood that the samples may be subjected to destructive testing and will not be returned.

1.12 GUARANTEE

This Contractor agrees to replace or repair to the satisfaction of the Owner, any part of the installation that may fail due to defective material and/or workmanship, or failure to follow Plans and Specifications for one year after final acceptance. He shall further obtain from the manufacturers of special equipment (i.e., control systems) their respective guarantees and service manuals and deliver to Owner.

1.13 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

The Engineer's decision will be final on interpretation of the Drawings and Specifications. Whenever "AS MAY BE DIRECTED", "SUITABLE", "APPROVED EQUAL", "AS REQUIRED", or other words of similar intent and meaning are used which infer that judgment is to be exercised, it is understood that it is the judgment of the Engineer being referred to.

PART 2 – PRODUCTS

2.01 RACEWAYS:

- A. Except where specifically shown otherwise in this section, the Contractor shall furnish and install a complete steel, rigid thread galvanized rigid steel conduit system for all wiring, including control and signal wiring.
- B. Galvanized Rigid Steel (GRS)
 - 1. All conduits shall be rigid threaded hot dipped galvanized type.
 - 2. Joints are to be sealed with conductive pipe compound T&B "Kopr-Shield" before making up.
 - 3. Conduits installed below grade shall be wrapped with 3M "Scotchrap #51" corrosion protection tape using half-laps for double thickness. Conduit surfaces are to be clean and dry before wrapping.
- C. Steel Electrical Metal Tubing (EMT)
 - 1. EMT may be used within the hollow dry spaces of buildings, minimum 96" above the finished floor. Trade sizes 4" and smaller may be used within hollow dry spaces of the building.
 - 2. EMT conduit shall be Allied True Color E-Z Pull, or equal.
 - 3. All raceway fittings, locknuts, couplings, elbows, etc., shall be hot dipped galvanized steel finish with plastic throats or bushings. Cast-type fittings shall not be used.

D. Non-Metallic Polyvinylchloride Conduit (PVC):

1. Rigid nonmetallic PVC, UL labeled, and fittings approved for the purpose may be used for electrical systems 0-600V-to-ground under the following conditions:
 - a. All conduits in earth under buildings or protected by permanent paving may be Schedule 40 PVC. Any conduits running through planters or unprotected are to be encased in 3" of concrete. All raceways above grade are to be steel.
 - b. Risers shall be blue color, factory PVC coated T&B "Ocal" steel ells. Bends less than 45 degrees and offsets may be field bent.
2. All nonmetallic runs shall have a bond wire for the interconnecting of all conducting portions per Article 250 of the California Electric Code.
3. PVC shall never be used above grade.

E. Liquid-Tight Flexible Metal Conduit (LFMC):

LFMC may be used in lengths not greater than 36" at motors and other machinery to prevent the transmission of vibration. LFMC shall be supported at both ends.

- F. Surface raceways and fastenings are to be two-piece steel type, complete with all fittings of the same manufacturer and factory finished in gray. Surface plug-in strips shall be two circuit type with NEMA grounded receptacles every 12" with wiring space provided.
- G. The minimum size conduit for lighting, power, and signal wiring shall be 3/4" trade size.
- H. Conduits installed underground shall have a minimum coverage of 24" below a finished grade. Provide a magnetically traceable warning tape at 12" below grade. Electrical systems rated greater than 150V to Ground shall have a 3" concrete envelope.
- I. MC Cable for branch circuits with EMT Home Runs.

2.02 CONDUCTORS:

- A. All conductors shall arrive to the project in their original, unbroken packages plainly marked as follows:
 1. Packaging shall indicate underwriter's labels, size, conductor material, insulation of wire, names of the manufacturer and the trade name of the wire.
 2. Wire or cable shall have factory markings every 24". Markings shall show its maximum allowable voltage, wire size and insulation.
- B. All conductors shall be a minimum of 98% conductivity, soft drawn copper, minimum #12 AWG unless shown otherwise. Conductors sized #8 and larger shall be stranded. Conductors sized #10 and smaller shall be solid type, except wiring within fixtures.

Insulation shall be 600 Volt, type "THWN-2."

- C. Control circuits for mechanical equipment in locations subject to abnormal temperatures on or under furnaces and heaters shall be Type "RHH" 600 Volt insulation conductors.
- D. All branch circuits, fixture wiring joints, splices, and taps for conductors #10 and smaller to be made with "Scotchlok" connectors.
- E. Two-bolt type solderless connectors or T&B "ColorKeyed" compression lugs shall be used on #8 and larger conductors.
- F. Soft drawn compact Aluminum feeder conductors may be used for phase conductors sizes # 1/0 and above and grounding conductors # 6 and above. Provide compression lugs with oxidation inhibitor for all aluminum termination.

2.03 WIRING DEVICES:

- A. Furnish and install wiring devices and plates as shown on the Drawings and described in these Specifications. Where more than one wiring device is mounted in the same location, such devices shall be mounted in a multi-gang plate. Wiring devices shall be specification grade or better.
- B. Wiring devices shall be of the color selected by the Architect.
- C. Convenience outlets to consist of a specification grade duplex receptacle mounted in an outlet box in the wall, flush with the finished plaster or surface. Outlet rating to be 20 AMPS, 125 Volts, 3-wire, back and side wired.
- D. All outlets shown outdoors or in damp locations shall be GFI type, installed in a weatherproof box and cover equipped with rubber gaskets. Surface outlets shall be weatherproof type FS boxes with hubs as required and equipped with rubber gaskets and weatherproof covers.
- E. Local switches shall be quiet toggle type, totally enclosed, 20 AMPS, 277 Volts AC rated.
- F. Device plates shall be provided for all devices with the number of gangs and openings necessary. They shall be satin brushed 302 stainless steel, unless specified otherwise.
- G. Switch plates for all outlets not in sight of a switch shall be labeled with filled etched letters showing locations of the outlet controlled.
- H. Pilot lights shall be the type with an indicating neon or LED lamp in a handle.

2.04 OUTLET BOXES:

- A. Outlet boxes for concealed work shall be one-piece, pressed steel, knock-out type with zinc or cadmium coating. Boxes shall not be smaller than 4" square nominal size unless otherwise indicated. Provide extension rings, extenders, plaster rings and covers

necessary for flush finish. No back-to-back or through-boxes shall be used.

- B. Bar hangers shall be used to support outlet boxes in stud or furred partitions and ceilings. Attachment screws, devices, etc., shall be of the proper type to secure boxes to metal studs. Use expansion shields in concrete and masonry. Where used for lighting fixtures, outlet boxes shall be equipped with fixture studs.
- C. Provide approved knock-out seals on all unused open knock-out holes.
- D. Outlet boxes installed in concrete slabs shall be two-piece concrete boxes, not less than 4" nominal size with a minimum depth of 2 ½".
- E. Surface boxes of cast metal threaded hub-type with suitable gasketed covers shall be used for exposed conduit runs less than 5' above finished floor, or where waterproof boxes are required.

2.05 PULL BOXES AND WIREWAYS:

- A. Pull and junction boxes shall be installed as shown to ease the pulling of wire and to comply with CEC requirements.
- B. Wireways shall be constructed in accordance with UL 870 for wireways, auxiliary gutters and associated fittings. Every component, including lengths, connectors, and fittings, shall be UL listed.

2.06 TERMINAL CABINETS AND CLOSETS:

- A. Cabinets and fronts shall be in accordance with NEMA Standard Publication No. PB 1-1971 and UL Standard No. 67. Fronts shall include doors and have flush brushed stainless steel, cylinder tumbler-type locks with catches and spring-loaded door pulls. The flush lock shall not protrude beyond the front of the door. All locks shall be keyed like the panelboard locks. Fronts are to be adjustable indicating trim clamps that shall be completely concealed when the doors are closed.
- B. Doors shall be mounted by completely concealed steel hinges. Fronts shall not be removable with the door in the locked position. A frame and card with a clear plastic covering shall be provided on the inside of the door. Fronts shall be of code gauge full finish steel with rust inhibiting primer and baked enamel finish.
- C. Install finish grade 3/4" plywood board, primed and painted light gray on both sides and the edges, at the interior rear surface of telephone and signal cabinets.
- D. Provide solderless box lugs, terminal blocks with a white marking strip for conductors sized #16 and larger. Punch-down terminals shall be used for No. 18 and smaller and shall be used for all public address, intercom and other electrical terminations.

2.07 FLOOR BOXES:

- A. Provide fully adjustable Type 1, Class 1 watertight 2 hour rated poke through floor

pockets complete with wiring devices where shown on Plans.

- B. Fittings for floor box cover finish shall be as selected by Architect.
- C. Verify floor finish prior to purchase. Provide carpet flanges of proper size in carpeted or tiled areas.

2.08 NOISE CONTROL:

- A. Outlet boxes at opposite sides of partitions shall not be placed back-to-back or through-boxes employed except where specifically permitted on the Drawings by note to reduce transmission of noise between occupied spaces.
- B. Contactors, starters, and similar noise-producing devices shall not be placed on walls that are common to occupied spaces unless specifically called for on the Drawings. Where such devices must be mounted on walls common to occupied spaces, they shall be shock mounted or isolated in such a manner to effectively prevent the transmission of their inherent noise to the occupied space.
- C. Contactors, starters, drivers, and like equipment found noticeably noisier than other similar equipment on the project will be deemed defective and shall be replaced at Engineer's request.

PART 3 – EXECUTION

3.01 INSTALLATION - GENERAL:

- A. The layout and installation of electrical work shall be coordinated with the overall construction schedule to prevent delay in completion of the project. Checking these Drawings before organizing the electrical work schedule or installing material and equipment shall be obligatory.
- B. Dimensions and information regarding accurate locations of equipment and structural limitations and finish shall be verified with other sections.
- C. The Drawings do not show all the offsets, bends, special fittings, junction boxes, or pull boxes necessary to meet job conditions and the CEC. They shall be provided as required.
- D. Electrical equipment, outlets, junction and pull boxes shall be installed in accessible locations avoiding obstructions, preserving headroom, and keeping openings and passageways clear.
- E. Minor adjustments in the locations of equipment shall be made where necessary, providing such adjustments do not adversely affect function of the equipment. Major adjustments for the location of equipment shall be approved by the Architect and detailed on the Record Drawings.
- F. Structural Fittings: Furnish and install the necessary sleeved, inserts, hangers, anchor

bolts and related structural items. Install at the proper time.

- G. Openings have been shown on the Architectural and Structural Drawings. Should any additional openings or holes be required for the work of this section, the cost shall be the obligation of this section.
- H. Contractors shall inspect and account for existing conditions affecting his work.
- I. Sleeves for electrical conduits passing through walls or slabs shall be placed under the work of this section before concrete is poured. Where conduits pass through suspended floor slabs, sleeves shall be standard weight galvanized steel pipe extending 2" above the finished floor level.
- J. Sleeves at other locations shall be either light weight galvanized steel pipe or galvanized sheet steel. Clearance between conduits and sleeves shall not be less than ½".
- K. Sleeves through outside walls and below grade shall be caulked tight with oakum and the ends sealed with an approved semi-plastic coal tar base compound or shall be of the stuffing box type. Other sleeves shall be packed with glass wood ends sealed with Duxseal and covered with chrome plated escutcheon plates.
- L. Conduits entering through floor slabs at grade level will not require sleeves and shall be placed with tops of couplings flush at floor level.
- M. Sleeves for electrical conduit passing outside walls below grade shall be the through-wall and floor seal type.

3.02 INSTALLATION OF CONDUITS AND RACEWAYS:

- A. Raceways for electrical or signal systems run in earth that are not protected by permanent paving shall be encased in concrete with the encasement extending under the building. Branch circuit and signal system conduits installed underground between outlets, terminals, and panels within the building shall be liquid and gas tight.
- B. Conduits shall be concealed unless otherwise shown. All conduit runs exposed to view, except those in attic spaces, shall be installed parallel or at right angles to structural members, walls, or lines of the building.
- C. All conduit runs shall be mechanically and electrically continuous from outlet to outlet. Conduit size or type shall not be changed between outlets.
- D. No conduits shall be run on the roof unless specifically shown on the roof. They shall be full weight rigid steel on PVC sleepers. Install roof jacks at penetrations.
- E. Conduit stubs installed for future extensions shall be rigid steel for at least 5' of a conduit run. The conduit ends shall be terminated with couplings and pipe plugs. The closed end shall be double wrapped with Scotchrap #50 for the last 12". The concrete envelope shall leave 3" of the wrapped conduit exposed for future connection.

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- F. Conduit for equipment connected permanently to the floor shall be installed with a 6" rigid conduit nipple to a flush coupling to ensure a watertight connection at the floor.
- G. All conduits shall be sloping to drain and shall be sealed with JM Clipper "Duxseal" on the high end.
- H. All conduit bends shall be carefully made so that the conduit is not flattened, kinked, or otherwise compromised. The inner radius of any conduit bend shall be not less than eight times the inside diameter. Where conduits are run exposed in groups, bends of all conduits shall have a common center. Use of standard elbows will not be allowed at these locations.
- I. Each run of a conduit shall be finished before concrete, plaster, etc., is installed to ensure against obstruction or omissions. After installation, the ends of all conduits shall be plugged with metal pennies. All conduit systems shall be completed and thoroughly cleaned and dried inside before installation of any conductors.
- J. Conduits shall enter at right angles and be connected to all outlet boxes, pull boxes, and cabinets with locknuts and plastic throated grounding bushings, providing a continuous grounding system in accordance with CEC Article 250.
- K. Use Erikson couplings where a union is necessary. Running threads will not be permitted.
- L. Pull 1/8" stranded nylon pull ropes with 18" coiled at each end in all empty conduits with identification tags indicating source and destination.
- M. Furnish and install seal-offs in all conduit runs through areas of different temperature.
- N. All concealed conduits shall be installed in as direct a line as possible between outlets. No more than four (4) quarter bends or their equivalent will be allowed between outlets. Feeder conduits shall follow arrangement shown on Plans unless a change is authorized. In general, branch circuit conduits shall follow the arrangement as shown insofar as structural conditions permit.
- O. All exposed runs shall parallel buildings, walls, or partitions, and shall be supported on Kindorf Hangers to meet Title 24 Part 6, California Code of Regulations.
- P. All telephone, data, and other signal conduits shall be installed with long radius sweeps. No factory ells will be permitted.
- Q. Chrome escutcheon plates are to be used on all conduit penetrating walls, floors or ceilings.
- R. Expansion joints shall be provided at building structural expansions or as required due to length of run or difference in temperatures.
- S. All fittings exposed or in damp areas shall have sealing glands and proper gaskets. Fittings in hazardous areas shall be of the type approved for the particular hazard.

- T. Provide two 1" conduit stubs out of all panels and terminal cabinets to above a hung ceiling or as otherwise shown.
- U. Roof Penetrations:
1. Where raceways penetrate roofing or any similar structural area, provide iron roof jacks sized to fit tightly to a raceway for a weather-tight seal with the flange extending a minimum of 9" under roofing on all sides. Completely seal the opening between the inside diameters of the roof flashing and the outside diameters of the penetrating raceways. Coordinate all work with the roofing section of Specifications.
- V. Fire Penetration Seals:
1. Seal all penetrations for work of this section through fire rated floors, walls and ceilings to prevent the spread of smoke, fire, toxic gas or water through the penetration before, during or after a fire. The fire rating of the penetration seal shall be at least that of which it is installed so that the original fire rating is maintained as required by CEC Article 300.21.
 2. Where applicable, provide OZ Type CFSF/1 and CAFSF/1 fire seal fittings for conduit and cable penetrations through concrete and masonry walls, floors, slabs and similar structures. Apply an approved firestopping system, including wall wrap, partitions, caps and other accessories as required. All manufacturers' instructions and recommendations for installation of sealing fittings and barrier sealing systems.

3.03 CONDUCTORS AND CONNECTIONS:

- A. General Requirements:
1. All branch circuit and fixture wiring joints, splices and taps for conductors #10 and smaller shall be made with UL approved connectors listed for 600 Volts. Connector bodies shall consist of a cone shape rotating expandable coil spring inserts insulated with phenolic or plastic shell.
 3. Do not install wire in conduits until all work of any nature that may cause injury (including pouring of concrete) is completed. Use care in pulling in wires to prevent damage to wire or insulation. Do not use blocks, tackle or other mechanical means to pull #8 AWG or smaller conductors.
 4. Splices are not permitted except in outlet boxes, pull boxes, junction boxes, panelboard gutters and auxiliary gutters. No splices shall be made in underground boxes.
 5. Use only wire pulling compounds listed by the UL as a lubricant for pulling conductors through raceways. The use of cleaning agents that have deleterious effect on conductor coverings are not permitted.

6. Unless otherwise shown on Plans or specified elsewhere, leave at least 12" of free conductors at each connected outlet (outlets connected to equipment or device) and 9" of free conductors and coil neatly in outlet box for future connection.

B. Terminations:

1. Circuit and signal terminations to single screw or push on terminals shall be done with insulated "Sta-Kons" or approved equal terminals.
2. Bolt type solderless connectors shall be torqued with a torque wrench according to the manufacturer's recommendations and then retightened after 24-48 hours before taping. Owners' inspector shall be informed of this procedure during the waiting period and shall witness the act of retightening.

C. Feeders and Branch Circuits:

1. Connectors and lugs for terminating stranded conductors sized #8 and larger shall be machine crimp compression type.
2. All splices shall be taped with Scotch "Super 88" vinyl electrical tape, and "Scotch Fill" tape putty where necessary for a smooth joint. For other than normal temperatures or conditions, Scotch #27 or #2520 shall be used.
3. No splices shall be made below grade in a manhole or pull holes without the Engineer's written approval. When approved, these shall be encapsulated with 3M potting kits per 3M Specifications.
4. Wires in panels, cabinets, pullboxes and wiring gutters shall be squared, labeled, and neatly grouped with Ty-raps and fanned out to the terminals.
5. Support all conductors in hand holes/manholes and label with plastic rope. Tag all conductors with plastic waterproof tags.

3.04 WIRING DEVICES:

- A. Wiring devices shall be securely fastened to the outlet box. Where the outlet box covers are back from the finished walls, the device shall be built-out with washers so that it is rigidly held in place to the box. Provide metal extenders in flammable construction per CEC.
- B. All device screw slots shall be left in a vertical orientation.

3.05 OUTLET BOXES:

- A. Boxes shall be securely fastened in position to the ceiling or walls with screws or bolts. Nails are not acceptable. The Contractor shall set and align all equipment, level, bolt down, or otherwise secure in place. No back-to-back or through-boxes shall be used.

- B. Boxes shall be accurately located and set square and true with exposed edges of a box or plaster ring flush with finished surface of walls or ceiling. All unused boxes shall be equipped with blank covers that shall match existing covers.
- C. Boxes shall have no unused openings.
- D. Boxes shall be cleaned of all direct plaster, etc., before conductors are installed. Rust spots shall be scraped to bare metal and painted with Rust-Oleum "Cold Galvanizing Compound".
- E. Suspended fixture outlets shall be equipped with 3/8" fixture mounting stud bolted to wood backing or metal studs to safely support fixture weight.
- F. Make any change in outlet location necessary to all job conditions and rearrange fixtures and equipment as directed.
- G. Study all Plans as to relation of spaces surrounding outlets so that this work may be installed at the proper time with others. Fixtures and equipment shall be symmetrically located. Conflicts and discrepancies shall be referred to the Architect immediately and prior to box installation.

3.06 JUNCTION AND PULL BOXES AND WIREWAYS:

- A. Boxes shall be installed square and plumb. An engraved nameplate shall be installed indicating the function of each box on the exterior in unfinished areas and on the interior in finished areas. Permanent markers are not acceptable.
- B. Pullboxes and wireways shall be concealed or installed flush in finished areas. They shall be surface mounted in machine rooms or unfinished areas.

3.07 TERMINAL CABINETS AND CLOSETS:

- A. Install, level, and identify per schedule.

3.08 FLOOR BOXES AND PEDESTALS:

- A. Floor boxes are to be installed level and plumb. Fill with paper prior to pouring concrete. Re-level after concrete has set, then raise to accommodate the floor finish. Core drill for poke through type.
- B. The installation of pedestals shall be coordinated with cabinet work.

3.09 IDENTIFICATION

- A. Conductors:
 - 1. All power and low voltage systems conductors and cabling shall be identified in accordance with the following schedule:

- a. 120/208 Volts, 3-phase, 4-wire Wye: Red-Black-Blue, Neutral White
 - b. 120/240 Volts, 3-phase, 4-wire Delta: Black-Blue for single-phase, Orange for 3-phase stinger, Neutral White
 - c. 480/277 Volts, 3-phase, 4-wire Wye: Yellow-Brown-Orange-, Neutral Grey
 - d. Bond or grounding conductor (GWG): Green
 - e. Special system conductors shall be color coded and labeled
2. Brady Labels shall be used to identify terminals and destination of feeders, branch circuits, signal and control circuits, etc., at all terminations and junction boxes and shall be coordinated with the nameplates in all boxes and equipment.
 3. All terminals in the switchboards, panels, relays, switches, devices, starter terminals, etc., shall have Brady Labels for identification to identify both ends of all wiring. Wires #8 and smaller to be terminated on terminal strips squared-type 9080K with white marking strip and screw lugs for wire size.
- B. Nameplates: The Contractor shall furnish and install 1" x 3" x 3/32" thick laminated black Nylon nameplates with a white core, unless specifically shown as red with a white core, engraved to produce white letters on black background for all items of electrical equipment including 2-pole and 3-pole circuit breakers, panelboards, starters, relays, time switches and disconnect switches. The plates shall be screwed in place with stainless steel screws. Adhesive backed plates are not acceptable.
- C. Panels: Panels having single-pole circuit breakers shall be provided with typed schedules mounted in welded metal holders behind plastic.
- D. Devices: All devices shall have their branch circuit identified on the back side of device plate with a permanent type black marker, i.e., CKT A-21.
- 3.10 SUPPORTS AND ANCHORS:
- A. Provide inserts, anchors, supports, rods, brackets and miscellaneous items to adequately support and secure the electrical systems and equipment.
 - B. Secure hangers, brackets, conduit straps, supports and electrical equipment to surfaces by means of toggle bolts on hollow masonry. Utilize expansion shields and machine screws or standard preset inserts on concrete or solid masonry. Utilize machine screws or bolts on metal surfaces. Utilize wood screws on wood construction. Wood, fiber plugs, or concrete nails are not acceptable.
 - C. Power or velocity driven inserts may not be used for any anchorage unless specifically approved by the Engineer and where the use does not affect the finished appearance of work. Under no circumstance shall these be used in pre-stressed slabs, beams, purlins, or precast members in tension.

- D. Seismic Requirements: Provide vertical and lateral supporting equipment to resist the application of seismic forces per California Code of Regulations, Title 24 Chapter 23.

END OF SECTION

GROUNDING

PART 1 – GENERAL

1.01 DESCRIPTION:

A. Work Included:

1. Provide and install a grounding system as specified and indicated.

B. Related Work:

1. See related Sections for their system grounding requirements.
2. Basic Electrical Requirements: Section 260000.
3. Common Work Results for Electrical: Section 260500.

1.02 SYSTEM REQUIREMENT:

- A. Grounding shall be as approved by the State of California, Division of Industrial Safety.
- B. Electrical continuity to ground for metal raceways and enclosures, which are isolated from the equipment ground by use of non-metallic conduit or fittings, shall be provided with a Code sized green insulated grounding conductor within each raceway connected to the isolated metallic raceways or enclosures at each end. Each flexible conduit shall be provided with a green insulated grounding conductor of Code approved size.
- C. Cold water or other utility piping systems shall not be used as the main system grounding electrodes due to the possible use of insulating couplings and nonmetallic pipe in such installations. All grounding electrodes shall be made electrodes as indicated on the drawings. Within every building the panels shall be bonded to a 1" or larger underground cold water service line with minimum 1" conduit, and one No. 6 wire. All metallic piping systems (gas, fire sprinkler) shall be bonded to the cold-water line with 3/4" conduit with one No. 8 wire.
- D. Non-current carrying metal parts of all high voltage, light and/or power, communications, control, and signal conduit systems, supports, cabinets, switchboards, enclosures, fixed equipment, portable equipment, and motor frames shall be permanently and effectively grounded.
- E. Service neutral conductors of light and/or power alternating current systems shall be grounded as indicated on the drawings and as required by the Utility Company.
- F. Secondary neutral conductors of all light, power and signal alternating current systems shall be grounded.
- G. Provide a "made electrode" bonded to the equipment enclosure at each separate building, including portable buildings, for each light and/or power system. Grounded (neutral) conductors shall be terminated at the neutral bus of the first panel or switchboard encountered within the building, and the neutral bus, equipment enclosure and "made electrode" shall be bonded together.

1.03 SUBMITTALS:

Submit a material list in accordance with Section 013300.

PART 2 – PRODUCTS

2.01 MATERIALS:

- A. Yard boxes for "made electrodes" shall be precast concrete as detailed on the drawings. Boxes shall be equipped with bolted down, checkered, cast iron covers and a cast iron frame cast into the box. Yard boxes shall be Brooks 36 or approved manufacturer.
- B. "Made electrodes" shall be approved copper clad steel ground rods, minimum 3/4" diameter 10' 0" long or a copper "Ufer" conductor encased in the concrete building foundation as indicated on the drawings.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. Grounding "made electrode" rods shall be located in the nearest usable planting area, where not otherwise indicated on the drawings, and each electrode shall terminate within a concrete yard box installed flush with finish grade. In planting areas, concrete yard box shall be 2" above planting surfaces.
- B. Rods shall be driven to a depth of not less than 10'-0". Electrodes shall have a resistance to ground of not more than 25 ohms if practicable. If the resistance exceeds 25 ohms, two or more electrodes connected in parallel shall be provided. The minimum number and size of ground rods shall be as required by State Electrical Safety Orders. Electrodes shall be separated from one another by not less than 6' 0". Parallel electrodes shall be connected together with approved fittings and approved grounding conductors in galvanized rigid steel conduit, buried not less than 12" below finish grade.
- C. The grounding resistance shall be tested by an approved independent testing laboratory in the presence of the DSA Inspector. The test results shall be submitted to the District Maintenance Supervisor on an official form for file with copies distributed to the District Inspector and Electrical Consulting Engineers.

END OF SECTION

ELECTRICAL IDENTIFICATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General Section 00700 and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

- A. This Section includes identification of electrical materials, equipment, and installations.

1.3 SUBMITTALS:

- A. General: Submit each item in this Paragraph according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.
- C. Schedule of identification nomenclature to be used for identification signs and labels.
- D. Samples for each color, lettering style, and other graphic representation required for identification materials; samples of labels and signs.

1.4 QUALITY ASSURANCE:

- A. Comply with California Electrical Code.
- B. Comply with ANSI C2.

1.5 SEQUENCING AND SCHEDULING:

- A. Coordinate installing electrical identification after completion of finishing where identification is applied to field-finished surfaces.
- B. Coordinate installing electrical identifying devices and markings prior to installing acoustical ceilings and similar finishes that conceal such items.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brady USA, Inc.; Industrial Products Division.

2. Carlton Industries, Inc.
3. Cole-Flex Corp.
4. EMED Co., Inc.
5. Ideal Industries, Inc.
6. Panduit Corp.

2.2 RACEWAY AND CABLE LABELS

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, California Electrical Code, and these Specifications.
- B. Conform to ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway or cable size.
 1. Color: Black legend on orange field.
 2. Legend: Indicates voltage and services.
- C. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl. Legend is over-laminated with a clear, weather- and chemical-resistant coating.
- D. Pretensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color-coded, acrylic bands sized to suit the diameter of the line it identifies and arranged to stay in place by pretensioned gripping action when placed in position.
- E. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide (0.08 mm thick by 25 to 51 mm wide).
- F. Underground Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 1. Size: Not less than 6 inches wide by 4 mils thick (152 mm wide by 0.102 mm thick).
 2. Compounded for permanent direct-burial service.
 3. Embedded continuous metallic strip or core.
 4. Printed Legend: Indicates type of underground line.
- G. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- H. Aluminum, Wraparound Marker Bands: Bands cut from 0.0140-inch (0.4 mm) thick aluminum sheet, with stamped or embossed legend, and fitted with slots or ears for permanently securing around wire or cable jacket or around groups of conductors.
- I. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, except as otherwise indicated, with eyelet for fastener.
- J. Aluminum-Faced Card-Stock Tags: Weather-resistant, 18-point minimum card stock faced on both sides with embossable aluminum sheet, 0.002 inch (0.05 mm) thick, laminated with moisture-resistant acrylic adhesive, and punched for the fastener. Preprinted legends suit each application.

- K. Brass or Aluminum Tags: Metal tags with stamped legend, punched for fastener. Dimensions: 2 x 2 inches (51 x 51 mm) x 0.05 inch (1.3 mm).

2.3 ENGRAVED NAMEPLATES AND SIGNS:

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, California Electrical Code, and these Specifications.
- B. Engraving stock, melamine plastic laminate, 1/16-inch (1.6 mm) minimum thick for signs up to 20 sq. in. (129 sq. cm), 1/8-inch (3.2 mm) thick for larger sizes.
 - 1. Engraved Legend: Black letters on white face.
 - 2. Punched for mechanical fasteners.
- C. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched for fasteners, with colors, legend, and size as indicated or as otherwise required for the application. 1/4-inch (6.4 mm) grommets in corners for mounting.
- D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose acetate butyrate signs with 0.0396 inch (1 mm) galvanized steel backing, with colors, legend, and size appropriate to the application. 1/4-inch (6.4 mm) grommets in corners for mounting.
- E. Fasteners for Plastic-Laminated and Metal Signs: Self-tapping stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS:

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties with the following features:
 - 1. Minimum Width: 3/16 inch (5 mm).
 - 2. Tensile Strength: 50-lb. (22.3 kg) minimum.
 - 3. Temperature Range: Minimum 40 to 185 degrees F (minimum 4 to 85 degrees C).
 - 4. Color: As indicated where used for color-coding.
- B. Paint: Alkyd-urethane enamel over primer as recommended by enamel manufacturer.

PART 3 – EXECUTION

3.1 INSTALLATION:

- A. Install identification devices according to manufacturer's written instructions.
- B. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
- C. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other

designations used for electrical identification with corresponding designations used in the Contract Documents or required by codes and standards. Use consistent designations throughout the Project.

- D. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- E. Self-Adhesive Identification Products: Clean surfaces of dust, loose material, and oily films before applying.
- F. Install painted identification as follows:
 - 1. Clean surfaces of dust, loose material, and oily films before painting.
 - 2. Prime Surfaces: For galvanized metal, use single-component, acrylic vehicle coating formulated for galvanized surfaces. For concrete masonry units, use heavy-duty, acrylic-resin block filler. For concrete surfaces, use clear, alkali-resistant, alkyd binder-type sealer.
 - 3. Apply one intermediate and one finish coat of silicone alkyd enamel.
 - 4. Apply primer and finish materials according to manufacturer's instructions.
- G. Identify Raceways and Exposed Cables of Certain Systems with Color Banding: Band exposed and accessible raceways of the systems listed below for identification.
 - 1. Bands: Pretensioned, snap-around, colored plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches (51 mm) wide, complete encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
 - 2. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15 m) maximum intervals in straight runs, and at 25 feet (7.6 m) in congested areas.
 - 3. Colors—as follows:
 - a. Fire-Alarm System: Red.
 - b. Fire-Suppression Supervisory and Control System: Red and yellow.
 - c. Combined Fire-Alarm and Security System: Red and blue.
 - d. Security System: Blue and yellow.
 - e. Mechanical and Electrical Supervisory System: Green and blue.
 - f. Telecommunications System: Green and yellow.
- H. Install Circuit Identification Labels on Boxes: Label externally as follows:
 - 1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
 - 2. Concealed Boxes: Plasticized card-stock tags.
 - 3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.
- I. Identify Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communications lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Where multiple lines installed in a common trench or concrete envelop, do not exceed an overall width of 16 inches (400 mm); use a single line marker.
 - 1. Limit use of line markers to direct-buried cables.
 - 2. Install line marker for underground wiring, both direct buried and in raceway.

- J. Color-Code Conductors: Secondary service, feeder, and branch circuit conductors throughout the secondary electrical system.
1. 208/120-V System--as follows:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White.
 - e. Ground: Green.
 2. 480/277-V System--as follows:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral: Grey.
 - e. Ground: Green.
 3. Factory-apply color the entire length of the conductors, except the following field- applied, color-coding methods may be used in lieu of factory-coded wire for sizes larger than No. 10 AWG.
 - a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps or made. Apply the last two turns of tape with no tension to prevent possible unwinding. Use 1-inch (25 mm) wide tape in colors as specified. Adjust tape bands to avoid obscuring cable identification markings.
 - b. Colored cable ties applied in groups of 3 ties of specified color to each wire at each terminal or splice point starting 3 inches (76 mm) from the terminal and spaced 3 inches (76 mm) apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.
 4. For all system voltages:
 - a. Isolated ground conductors: Green with yellow stripe.
 - b. Mark with a 1" band of green tape, followed by a 1" band of yellow tape, followed by a 1" band of green tape.
- K. Power Circuit Identification: Use metal tags or aluminum wraparound marker bands for cables, feeders, and power circuits in vaults, pull boxes, junction boxes, manholes, and switchboard rooms.
1. Legend: 1/4 inch (6.4 mm) steel letter and number stamping embossing with legend corresponding to indicated circuit designations.
 2. Fasten tags with nylon cable ties; fasten bands using integral ears.
- L. Apply identification to conductors as follows:
1. Conductors to be extended in the future: Indicate source and circuit numbers.
 2. Multiple power or lighting circuits in the same enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding for voltage and phase indication of secondary circuit.
 3. Multiple control communications circuits in the same enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

- M. Apply warning, caution, and instruction signs and stencils as follows:
1. Install warning, caution, and instruction signs where indicated or required to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved, plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install butyrate signs with metal backing for outdoor items.
 2. Emergency-Operating Signs: Install engraved laminate signs with white legend on red background with minimum 3/8 inch (9 mm) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.
- N. Install Identification as follows:
1. Apply equipment identification labels of engraved plastic laminate on each major unit of equipment, including central or master unit of each system. This includes communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Except as otherwise indicated, provide a single line of text with 1/2 inch (13 mm) high lettering on a 1 1/2 inch (38 mm) high label; where two lines of text are required, use lettering 2 inches (51 mm) high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment.
 - a. Panel boards, electrical cabinets, and enclosures.
 - b. Access doors and panels for concealed electrical items.
 - c. Electrical switchgear and switchboards.
 - e. Motor control centers.
 - f. Motor starters.
 - g. Push-button stations.
 - h. Contactors.
 - i. Remote-controlled switches.
 - j. Dimmers.
 - k. Control devices.
 - l. Transformers.
 - m. Telephone switching equipment.
 - n. Clock/program master equipment.
 - o. TV/audio monitoring master station.
 - p. Fire-alarm master station or control panel.
 - q. Security-monitoring master station or control panel.
 2. Apply designation labels of engraved plastic laminate for disconnect switches, breakers, push-buttons, pilot lights, motor control centers, and similar items for power distribution and control components above, except panel boards and alarm/signal components where labeling is specified elsewhere. For panel boards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker.

END OF SECTION

LOW VOLTAGE ELECTRICAL TRANSMISSION

PART 1 – GENERAL

1.01 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. Section 26 05 00 - Basic Materials and Methods section and other Division 26 sections apply to work specified in this section.

1.02 SCOPE:

- A. Work included: Furnishing and installation of a complete electrical service, distribution, and grounding system. Conditions of this section apply to all other 26 40 00 series sections included.
- B. Related Work: Refer to other sections, particularly those listed below, so as to properly coordinate work specified herein with that specified elsewhere to produce a finished, workmanlike, fully functioning installation.
- C. All other Electrical Sections: Division 26

1.03 QUALITY ASSURANCE:

See Section 26 05 00.

1.04 SUBMITTAL:

- A. Product Data: Submit manufacturer's data on service entrance equipment, switchboards, motor control centers and/or individual starters, transformers, panelboards, disconnect switches and grounding components.
- B. Trip Curves: When requested, submit trip timing curves for all circuit interrupting devices.
- C. Nameplate Schedule: Submit nameplate schedule for approval.

1.05 COMPONENT COORDINATION:

In order to maintain close control and coordinate the various components of the distribution systems, the number of manufacturers shall be kept to a minimum. Equipment manufacturer shall be General Electric or Square D. It shall be the manufacturer's responsibility through the Electrical Contractor to coordinate all components of the system in order to ensure systems that will provide maximum protection of equipment and reliable safe operation.

1.06 NAMEPLATES:

Laminated phenolic plastic, color coded black for 120/208 volt equipment, with white letters. Provide for identification of each transformer, panelboard and motor control center, secure to face with two (2) chrome plated screws each. A schedule of nameplates shall be included with the shop drawings for approval.

1.07 FEEDER CONNECTIONS:

Provide cast, saddle type bolted lugs or hydraulically set compression lugs for all bus connections. Manufacturer shall be Thomas and Betts, Burndy, O.Z. or approved equal. Lugs in which the set of screw embeds directly into feeder conductor shall not be used.

1.08 MISCELLANEOUS:

- A. Equipment Bases: Provide appropriately sized concrete housekeeping bases for all floor-mounted equipment.
- B. Hoisting Lifting Lugs: Provide on all heavy equipment as required to ensure safe hoisting.
- C. Space for Future Protective Device: Provide as indicated on drawings; shall be completely equipped for the future addition of a circuit breaker or fused switch, including all connections.

PART 2 – PRODUCTS

2.01 PANELBOARDS:

- A. Panelboards shall be Bolt-down Circuit Breaker type, with voltage, phase, and breakers as specified in panelboard schedules. Panelboards shall be installed flush or surface or specified, at locations as indicated on plans. Panelboards shall be installed in code gauge rust proof steel cabinets with flush door having flush locks all keyed alike and with trim cut square and true.
 - 1. Panelboards: General Electric A-Series and Spectra Series; Square D, type I-Line, NQ, NQOB, and NF; or approved equal.
- B. All panelboards and breakers shall meet the requirements of the indicated available symmetrical short circuit current or have a minimum bus bracing to meet figure shown.
- C. All interiors shall be completely factory assembled. They shall be so designed that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors, so that circuits may be changed without machining, drilling or tapping.
- D. Branch circuits shall be arranged using double row construction except when narrow

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column panels are indicated. A nameplate shall be provided listing panel type and ratings.

- E. Unless otherwise noted, full size insulated neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral bussing shall have a suitable lug or each outgoing feeder requiring a neutral connection. A ground bus will be included in all panels.
- F. Boxes shall be at least 20 inches wide made from galvanized steel. Provided minimum gutter space in accordance with California Electric Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space. At least four interior mounting studs with adjustable nuts shall be provided.
- G. Door hinges shall be concealed. All locks shall be flush, stainless steel, cylinder tumbler type locks with catches and spring loaded door pulls, keyed alike and directory frame and card having a transparent cover shall be furnished with each door.
- H. All exterior and interior steel surfaces of the trim shall be properly cleaned, primed with a rust inhibiting phosphatized coating and finish with a gray ANSI 61 paint. Trims for flush panels shall overlap the box for at least 3/4 inch all around. Surface trims shall have the same width and height as the box. Trims shall be mountable by a screwdriver without the need for special tools. After installation, trim clamps shall not be accessible when the panel door is closed and locked.
- I. All main bus bars shall be cooper or tin plated aluminum sized in accordance with UL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C above an ambient of 40 degrees C maximum.
- J. Circuit breakers shall be quick-make, quick-break, thermal-magnetic, trip indicating, and have common trip on all multipole breakers. (Trip indication shall be clearly shown by the breaker handle taking position between ON and OFF when the breaker is tripped). Branch circuit breakers feeding convenience outlets shall have sensitive instantaneous trip settings of not more than 10 times the trip rating of the breaker to prevent repeated arcing shorts resulting from frayed appliance cords. Single pole 15 and 20 ampere circuit breakers shall be UL listed as "Switching Breakers" and carry the SWD marking. UL Class A (5 milliamperere sensitivity) ground fault circuit protection shall be provided on 120V ac branch circuits as specified on the plans or panel board schedule. This protection shall be an integral part of the branch circuit breaker which also provided overload and short circuit protection for branch circuit wiring. Tripping of a branch circuit breaker containing ground fault circuit interruption shall not disturb the feeder circuit to the panelboard. A single pole breaker containing ground fault circuit interruption shall not disturb the feeder circuit to the panelboard. A single pole circuit breaker with integral ground fault circuit interruption shall require no more panelboard branch circuit space than a conventional slide pole circuit breaker. Connections to the bus shall be bolt on.

2.04 DISCONNECTS:

- A. Motor and circuit disconnects shall have an Underwriters' Laboratory label.
- B. Disconnect switches shall be suitable for area where they are installed, i.e., weatherproof, and shall be rated heavy duty. Use only 600 volt class with proper number of poles. Switches shall be fused unless indicated on plans. Fuses shall be of type specified on plans.
- C. When a disconnect switch is not clearly visible from the control location, provide an operating handle which is lockable in the open position.

2.05 GROUNDING:

- A. Clamps, bonds, etc. suitable and as necessary to provide continuous ground system.
- B. Ground Rods: "Copperweld" 3/4" diameter, 10' long.
- C. All grounding conductors shall be copper, sizes not less than that required under CEC Table 250.122.
- D. All grounding electrode conductors shall be copper, sizes not less than that required under CEC Table 260.66.

2.06 SWITCHBOARDS:

- A. Manufacturer's: Subject to compliance with requirements, provide switchboards of one of the following:
 - General Electric Company
 - Square D Company
- B. General: Except as otherwise indicated, provide switchboards of types, sizes, characteristics, and ratings indicated, which comply with manufacturer's standard design, materials, components, and construction in accordance with published product information, and as required for complete installation. Service entrance switchboards shall comply with serving utility requirements.
- C. AC Dead-Front Distribution Switchboards: Provide factory assembled, dead-front, metal enclosed, self-supporting secondary power switchboards, of types, sizes and electrical ratings and characteristics indicated; consisting of panel (vertical) units, and containing circuit breakers of quantities, ratings and types indicated. Provide copper or tin plated aluminum main bus and connections to switching devices of sufficient capacity to limit rated continuous operating temperature rise to 54 degrees F, and 90 degrees F for circuit breaker branches; with main bus and tap connections silver-surfaced and tightly bolted for maximum conductivity. Brace bus for short circuit stresses up to maximum interrupting capacity. Prime and paint switchboard with manufacturer's finish and color. Construct units for outdoor, NEMA Type 3R.

- D. Enclosures: Construct dead-front switchboards, suitable for floor mounting, with front cable/wire and conduit accessibility as indicated. Provide welded steel channel framework, hinge wireway front covers to permit ready access to branch circuit breaker load slide terminals. Coat enclosures with manufacturer's standard corrosive resistant finish.
- E. Bussing: Provide switchboard with sufficient cross-sectional area to fulfill U.L. Standard 891 pertaining to temperature rise.

2.06 MOTOR STARTERS (When used):

- A. Manual motor starters to be quick-make, quick break, with overload protection. General Electric cr 101, or Square D equivalent, for 120/240 volt 1 hp or less.
- B. Magnetic motor starters shall be across the line unless indicated with control power transformer (120 volt coil) and with overload relay protection. Combination type shall have integral fused switch or circuit breaker as indicated.

2.07 TRANSFORMERS:

- A. Transformers, Dry Type: Distribution transformers shall be constructed and tested in accordance with ASA and NEMA Standards, TP-1 minimum, and shall be wound with copper or aluminum conductors. Performance of transformers shall be equal to or exceed ASA and NEMA published criteria.
- B. Transformers shall be self-cooled type with Class H, NEMA, Group 111 insulation and a temperature rise of 150°C under continuous full load conditions with an ambient of 400°C.
- C. Transformers supplying voltage to wave altering devices (computers, electronic ballasts, etc.) shall be K4 rated minimum, or as noted otherwise on plans.
- D. Transformers shall be equipped with four 2-1/2% taps (2 taps above and 2 taps below normal voltage). Windings shall be of the fire-resistant type, designed for natural convection cooling through normal air circulation.
- E. Core mounting frames and enclosures shall be of welded and bolted construction with sufficient mechanical strength and rigidity to withstand shipping, erection and short circuit stresses.
- F. Enclosure cover plates shall be Code gauge sheet steel, captive bolted to the enclosure framework. Enclosure shall have suitable ventilating openings with rodent-proof screens. Enclosure shall be provided with lifting lugs and jacking plates as required.
- G. Transformers shall be furnished complete with mounting channels and mounting bolts. Metal parts, except cores and core mounting frames, shall be cleaned, rust-proofed and given a heavy coating of an inert primer.
- H. Transformers used indoors shall be "low noise." They shall be provided with vibration

dampers. Size and number of shock mounts shall be in accordance with manufacturer's recommendations.

- I. Transformers shall be manufactured by General Electric, Square D, or approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION OF SWITCHGEAR AND SWITCHBOARDS:

- A. Install switchgear and switchboards as indicated, in accordance with manufacturer's written instruction, and with recognized industry practices to ensure that switchboards comply with requirements of NEMA and CEC standards, and applicable portions of NECA's "Standard of Installation".
- B. Prior to energization of circuitry, check all accessible connections to manufacturer's torque specifications. Subsequent to wire and cable hook-ups, energize switchboards and demonstrate functioning in accordance with requirements.

3.02 INSTALLATION OF PANELBOARDS:

- A. Provide mounting brackets, busbar drilling, and filler pieces for unused spaces.
- B. Branch circuits shall be connected as shown in line diagrams and/or panelboard schedules, with wires neatly tie wrapped in panel.
- C. All distribution panelboards shall have all sub feeders and main breakers marked with 1" x 3" plastic name tags secured with two self-tapping screws.
- D. All panelboards shall be provided with a 2" x 3-1/2" plastic name tag on the front of the panel door or on the trim, indicating panel designation and distribution panel and circuit feeding above panel, secured with two self-tapping screws.
- E. Branch circuit panelboards shall have a plastic covered circuit directory card on the inside of each door with all circuit destinations neatly typed.
- F. Contractor shall check and tighten all factory made wire or lug connections. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A.
- G. Install four (4) spare 3/4" conduits from all panelboards to accessible ceiling space.

3.03 INSTALLATION OF DISCONNECTS:

Install disconnects for all equipment and motors of the size required and as recommended by manufacturer.

3.04 INSTALLATION OF GROUNDING:

- A. Scope: Provide grounding system complying with the codes and ordinances specified. Grounding system shall provide continuity through the entire electrical system.
 - 1. Panelboard ground buses.
 - 2. PVC conduit or other raceways.
 - 3. All motors.
 - 4. All lighting fixtures.
 - 5. Grounding terminals of all receptacles.
 - 6. Miscellaneous grounds required by code.
- B. Equipment and raceway bonding procedures shall be rigidly maintained and meet all jurisdictional requirements of codes and regulations.
- C. Good, electrically continuous, metal to metal contacts shall be made wherever possible at all panel boxes, pull boxes, etc. Where it is not possible to obtain good contacts, the conduit shall be bonded round the boxes with a 6 BS gauge, rubber covered, double braided wire with ground clamps.
- D. A separate grounding conductor shall be run in all conduit runs from distribution, lighting, and power, etc. panelboards, motor control outlets, etc., back to their respective service or distribution panelboards.
- E. Flexible Conduit Grounding: Provide a separate grounding conductor in all flexible conduit runs to include watertight flexible conduit with integral grounding straps. Install ground conductors inside conduit with ungrounded conductors. Extend from nearest panel to device being connected.
- F. Receptacle Circuits: Provide a separate grounding conductor in all receptacle circuit conduit runs, back to serving panelboard.

3.05 INSTALLATION OF MOTOR STARTERS:

- A. In finished areas, mount motor protection switches flush and install suitable cover plates.
- B. Install heaters correlated with full load current of motors provided.
- C. Set overload devices to suit motor provided.

3.06 INSTALLATION OF TRANSFORMERS

- A. Transformer core frame shall be installed level on shock absorbing pads within the enclosure.
- B. Mounting bolts on floor-mounted transformers shall be extended into pads only and shall not be in direct contact with building structural members.
- C. Flexible jumpers shall be installed for grounding continuity from enclosure to conduits.
- D. Voltage Check:
 - 1. The Contractor shall set the taps on all transformers (which are a part of this contract) as necessary to provide satisfactory operating voltages with all present loads energized. A check shall be made in the presence of the District Inspector at a panel fed from each transformer and which is the farthest from the transformer. Voltages at the transformers ranging from 118 to 122 volts inclusive, for 120-volt systems and proportionately equivalent for higher voltage systems, are acceptable.
 - 2. The Contractor shall provide all instruments and accessories required to perform the checks. Volt meters shall be accurate within 1% and shall have scales permitting the voltage readings to be made on the upper half of the scale.

END OF SECTION

LIGHTING FIXTURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work Included: Furnish and install lighting fixtures including lamps; connect fixtures to circuits, occupancy sensors, relays, room controllers, contactors, control panels, and gateways, where applicable.
- B. Related Work:
 - 1. Common Work Results for Electrical: Section 26 05 00.
 - 2. Low Voltage Electrical Transmission: Section 26 20 00.

1.02 SUBMITTALS

- A. All submittals shall be made in accordance with Division 1 Submittal Procedures.
- B. List of Materials: Submit a complete list of material proposed for this Section.
- C. Shop Drawings for Lighting Fixtures: Provide detailed and dimensioned working drawings showing kind, weight and thickness of materials, method of fitting and fastening parts together, location and number of sockets, size and color of lamps, and complete details of the method of fitting, suspension and securing the fixtures in place. Drawings shall contain sufficient information to enable a workman to construct and install the fixtures without further instructions.
- D. Shop Drawings for Lighting Controls: Provide manufacturer-detailed and complete wiring diagrams and plans for lighting controls. Provide cut sheets for lighting control devices and cabling.

1.03 MOUNTING REQUIREMENTS

Comply with State of California earthquake requirements and CEC requirements for lighting fixture installations and support.

1.04 GUARANTEE

- A. Guarantee lighting components against service failure for five years. Indicate installation date on each driver by inscribing month, day and year on the housing.

PART 2 – PRODUCTS

2.01 MATERIAL AND FABRICATION

- A. Each lighting fixture shall be the type indicated on the drawings and as specified herein. Fixtures of the same type shall be of identical make, design and appearance. The size of each lighting fixture shall be as specified herein for the lamp or fixture wattage indicated on the drawings.
- B. The design of all lighting fixtures, accessories and supports, as well as the method of hanging fixtures, shall comply with all requirements for earthquake resistant construction of the State of California.

2.02 LIGHT FIXTURES

- A. LED Drivers: Drivers shall be electronic type specifically designed to save energy while maintaining full light output. Drivers shall have "A" sound rating, thermal protectors and guaranteed against service failure for three years. Drivers shall comply with FCC and NEMA limits governing electromagnetic and Radio Frequency Interference and meet all applicable ANSI, State and Federal standards. The contractor shall indicate the installation date on each driver by inscribing the month, day and year on the ballast case. Drivers shall be noiseless, high power factor type and shall be ETL certified under CBM Standards and Underwriters' Laboratory listed.
- B. LED Diodes shall have the following minimum characteristics:
 - 1. Efficacy – 100 lumens per watt or greater
 - 2. Color rendition index – 80 or greater, unless scheduled otherwise
 - 3. Standard deviation color matching for diodes shall fall within 1 MacAdam ellipse.

2.03 LIGHTING CONTROLS

- A. Lighting controls and control systems shall meet all requirements of the State of California Title 24 energy code.
- B. Lighting control systems shall be commissioned by a factory lighting commissioner. Commissioning by the contractor is not acceptable.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install lighting fixtures where shown on plans.
- B. Fixture voltage shall be as shown on drawings and in the fixture schedule.

- C. Install recessed and surface-mounted fixtures with mounts or plaster frames compatible with the ceiling and wall systems employed and secure fixtures mechanically to frames.
- D. Align rows of surface-mounted fixtures to form straight lines at uniform elevations. Provide factory joiner bands for contiguous fixtures, and end caps on ends.
- E. Recessed fixtures shall fit snugly against ceilings to prevent light leakage.
- F. Support suspended recessed fixtures in a T-bar ceiling as follows: All fixtures shall be attached to the ceiling grid to resist a horizontal force equal to the weight of the fixtures. For heavy duty grid systems, fixtures weighing less than 56 pounds must also have two 12 gauge slack safety wires from diagonal corners to the structure above; fixtures weighing more than 56 pounds shall be independently supported by not less than 4 taut No. 12 gauge wires capable of supporting four times the load. For intermediate duty grid systems, fixtures shall be independently supported by not less than four taut No. 12 gauge wires capable of supporting four times the load. All fixture hanger wire ends shall be twisted three tight turns within a 2" distance. Fixture installation shall be coordinated with the acoustical ceiling installation.
- G. Light Pole Installation:
 - 1. Set in concrete footings; set poles plumb and straight. Grout and dry-pack after leveling poles. Concrete, grout and dry-pack are specified under Section 03 30 00, Cast-in-Place Concrete.
 - 2. Electrically ground the fixtures and poles.
 - 3. Solder and tape splices as required for the floodlight fixture installations.
 - 4. Each standard shall be tapered galvanized steel, with handhole, anchor bolts, fixture mounting brackets and all accessories.
 - 5. Poles shall be designed to withstand a minimum wind velocity of 80 mph sustained, 104 mph gusts.
- H. Provide factory commissioning for lighting controls and devices. The completed installation shall comply in every way with the requirements of Title 24.

3.02 CLEANING

- A. Clean surfaces of all dirt, cement, plaster and other debris. Use cleansers compatible with material surfaces being cleaned.
- B. Clean lenses, reflectors, and the like of dust, fingerprints, and grime.

3.03 TESTING

- A. Check and adjust fixtures for even illumination.
- B. Replace defective fixtures and fixture components with new.

- C. The lighting control system shall be acceptance tested by an independent company. The agent shall not be an employee of or affiliated with the contractor. The contractor is responsible for making any adjustments to pass the acceptance tests.

END OF SECTION

COMMUNICATIONS

PART 1 – GENERAL

1.1 Related Sections

- A. This specification section provides general conditions for all division 27 specifications. All contractors working with in the division 27 specification shall adhere to this specification and these related specifications:

Section 270528 - Communication Infrastructure Systems
Section 271000 - Structured Cabling System
Section 272010 - Uninterruptable Power Supply
Section 274200 - Classroom Audio/Visual Systems
Section 275313 - Analog Synchronous Clocks
Section 277000 - Intercom-Clock-PA System
Section 278000 - Video Surveillance System

1.2 Statement of Work

- A. This document describes the requirements for the contractors, products and installation relating to furnishing and installing Structured Cabling and Communications Systems.
- B. Contractor will provide a bid including all labor, materials, tools and equipment required for the complete installation of work called for on the Construction Drawings and described in this Document. It is the responsibility of the Contractor to provide all material necessary to provide a complete and operable system. If the contractor feels that the system described is incomplete, they must address this in writing to the Owner/Owner's Representative before providing a bid.
- C. All questions concerning non-specified product and services will be address to the Owner's Representative before Contactor provides a bid. Owner expects that by accepting the Contractor's bid proposal that the Contractor has provided a competent bid for a complete solution.
- D. Product specifications, general design considerations, and installation guidelines are provided in this document. Quantities of devices, typical installation details, and mounting details will be provided as an attachment to this document. The successful vendor shall meet or exceed all requirements for the systems described in this document.
- E. Contractors DO NOT remove Owner network equipment without written approval from the Owner.

- 1.3 Existing cabling and systems equipment (when existing systems are in scope)
- A. Demolition of cabling systems per 2022 CEC:
1. Remove all cabling defined for demolition per CEC 640.2, 640.6.C, 645.2, 645.5.F, 725.2, 725.25, 770.2, 770.25, 770.154.A, 800.2, 800.25, 800.154.A, 820.2, 820.25, 820.154, 830.2, 830.25,
 2. The owner shall be given “first right of refusal” for all decommissioned equipment and removed cable.
 3. The owner may wish to keep, recycle or destroy these items. If the items are refused by the owner the contractor may keep, recycle or destroy these items.
 4. Owner will establish a location for all materials it wishes to keep, recycle or destroy.
- B. Contractor SHALL NOT demo any existing analog telephone cables or outlets, except where complete reconstruction occurs. The existing telephone cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any telephone cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed.
- C. Contractor SHALL NOT demo any existing intercom cables or outlets, except where complete reconstruction occurs. The existing intercom cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any intercom cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed.
- D. Contractor SHALL NOT demo any existing coaxial CATV cables or outlets, except where complete reconstruction occurs. The cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed.
- E. Contractor SHALL NOT demo any existing CCTV cables, outlets, or cameras except where complete reconstruction occurs. The existing cabling will remain intact and used by the district upon re-occupancy. Contractor shall repair any cabling they damage during this project. Cut cables must be replaced end to end, no splice repairs will be allowed. Coordinate with Owner for the removal of any cameras in the way of the scope of work. Owner will remove existing cameras.
- F. Contractor to coordinate with the Owner for the scheduled removal of any existing network equipment, such as, but not limited to, wireless access points, access point mounting brackets, network switches, and network routers. All equipment is to be removed by Owner and NOT the contractor. Owner will remove and re-install any network equipment unless specifically coordinated with Contractor.

1.4 Regulatory References

A. Contractor will comply will all Federal, State, Local Codes/Regulations and Industries Standards.

1. Federal:

- California Electric Code(CEC) 2022, Chapter 8: “Communications Systems” Article 250: “Grounding”
- FCC - Part 15, Part 68
- ADA – Americans with Disabilities Act

2. State of California:

- CCR Part 2 - California Building Code.
- CCR Part 3 - California Electrical Code
- Occupational Safety and Health Act (OSHA).
- Title 24, Building Standards, State of California.
- Title 19, California Code of Regulations.
- Title 8, Electrical Safety, State of California

3. ANSI Standards:

- ANSI C2-2001 National Electrical Safety Code.
- ANSI C80.3 Specification for Zinc-coated Electrical Metallic Tubing.
- ANSI/UL 797 Electrical Metallic Tubing.
- ANSI/ICEA S-83-596-2001 - Fiber Optic Premises Distribution Cable Technical Requirements.

4. Industry Standards:

- Telecommunications Industry Associations/Electronics Industry Association (TIA/EIA)
 - TIA/EIA-568.0-D Commercial Building Telecommunications Cabling Standard
 - TIA/EIA-568-1.D General Requirements
 - TIA/EIA-568-C.2 Balanced Twisted Pair Cabling Components Standard
 - TIA/EIA-568-3-D Optical Fiber Cabling Components Standard
 - TIA/EIA-569-A Commercial Building Standard for Telecom Pathways and Spaces
 - TIA/EIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - TIA/EIA-607 Commercial Building Grounding/Bonding Requirements
 - TIA/EIA-758 Customer-Owned Outside Plant Telecommunications Cabling Standard
 - TIA/EIA-758-1 Addendum No. 1 to TIA/EIA-758, Customer-Owned Outside Plant Telecommunications Cabling Standard
- National Electrical Manufacturer’s Association (NEMA)
- Institute of Electrical and Electronic Engineers (IEEE)

802.3 (Ethernet)

802.3ab (Gigabit Ethernet over 4-pair Category 5e, 6 & 6A or higher)

802.3Z (Gigabit Ethernet over optical fiber)

802.11ac (Wireless LAN Specifications)

- Underwriters Laboratories Inc. (UL)
- International Organization for Standardization/International Electromagnetic Commission (ISO/IEC) ISO 11801 Generic Cabling for Customer Premises
- Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM 13th Edition or latest).
- ASCII - American Standard Code for information Interchange
- ASTM - American Society for Testing and Materials

- B. If there is a conflict between applicable documents, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the documents. The Contractor has the responsibility to determine and adhere to the most recent release when developing the proposal for installation.
- C. This document does not replace any code, either partially or wholly. The contractor must be aware of and comply with all local codes that may impact this project.

1.5 Safety/Contractor Qualifications/Quality Assurance

A. Safety and Indemnity

1. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of persons and property during performance of work.
2. The Contractor shall ensure that all personnel working in or anywhere on the site shall be provided a hard hat, safety shoes, a face shield or safety goggles, etc. for their protection.
3. No act, service, drawing review or construction observance by the owner's representative or any other party employed by the campus is intended to include review or approval of adequacy of the Contractor's safety measures, in, on or near the construction site.

B. Contractor Qualifications

1. Each low voltage contractor/sub-contractor shall submit their qualifications to the district prior to award of contracts.
2. Contractor shall have been in business for no less than five (5) years and have installed of a minimum of 3 projects of similar size and scope.
3. A Manufacturer Certified Installer contractor, currently certified in the Owner's standard solutions, shall complete the System installation. The contractor shall have completed standards-based product and installation training. A copy of the Contractor's Manufacturer Certified Installer certificate shall be submitted with their submittal.

4. Sub-Contractor Qualifications
 - All Contractors shall submit a list of at least three (3) projects of similar dollar volume completed within the past 24 months for reference purposes.
 - The Contractor shall compile detailed information relating to similar work completed, including corporate references sufficient to enable the Owner to evaluate and agree to the Contractors' responsibility, experience and capacity to perform the work.
 - Each Contractor to perform telecommunications work on this project shall possess a C-10 or C-7 (formerly C-61) Limited Specialty License for Telecommunications and must be certified for the installation, termination, splicing, and testing of copper cables, fiber optic cable, riser cable, and inside wiring. The appropriate contractor's license for underground construction and conduit installation is also required.
 - An on-site Contractor superintendent must be available at all times. Contact can be by person or telephone.
5. Contractors who do not meet the minimum specified requirements will not be accepted.

C. Quality Assurance

Contractors are required to comply with the following without exception:

1. The winning Contractor will assign this project to a competent Project Manager who has demonstrated their ability to supervise a telecommunications project of the same size and scope.
 - The contractor will make this person available to the Owner/Owner's Representative before the start of this project for an interview. This person must be deemed acceptable by the Owner and/or their Representative before work can begin.
 - Project Manager will be required to be available for scheduled on site project meetings at no additional cost to the Owner.
 - Project Manager will be required to be available to meet on site with the Owner/Owner's representative with a minimum of 24 hours' notice for non-emergency issues, and a minimum of 4 hours for emergency issues at no additional cost to the Owner.
2. All material and equipment to be installed on this project shall be "new". If the Owner/Owner's Representative discovers that "used" material or equipment has been installed on this project the Contractor will be required to replace said materials and/or equipment with "new" products at no additional cost to the Owner.
 - "New" - Materials and products shall be manufactured within one (1) year prior to installation and meet or exceed the latest published specifications of the manufacturer. Also, these materials and equipment may not have been in use before installation on this project unless directed otherwise in the project documents.
3. Contractor must warranty all materials, equipment and labor for a minimum of one (1) year from the Owner's acceptance of the work.

- Warranty will provide repair/replacement of all defective or improperly installed materials at no additional cost to the Owner (including Labor, drive time, shipping, taxes, etc.).
 - Contractor is required to keep in stock replacement parts for all items covered in this specification and provide a competent service technician to be on site to repair/replace defective items no later than 24hours after receiving trouble call.
 - Warranty will cover normal Business hours, 8am – 5pm, Monday thru Friday. All calls received on a Friday or the day before a holiday will be held until the following regular business day.
4. Contractor must submit for full manufacturer extended warranty upon completion of the project. Warranty certificate to be sent directly to Owner.

1.6 Submittal Documentation

- A. The successful contractor shall provide their submittal package in accordance with the Section 01 20 00 1.06 Submittal Schedule
- B. The successful contractor shall provide three (3) copies of their submittal package.
- C. The Submittal Package will include:
1. All documentation given will be in a Bond Cover or in a Three (3) Ring Binder.
 2. A coversheet on the Contractor's Company Letterhead including:
 - Contractor's Name
 - Contractor's License Number
 - The Project Name
 - The Specification Number and Description
 - The date documentation was submitted.
 3. A spreadsheet with a full material list of products and equipment included in the Contractor's bid price. Spreadsheet will provide:
 - Manufacture Name
 - Part Number
 - Description
 - Quantity to be installed for each part.
 4. A legible copy of the Manufacturer's Catalog Cut sheet for each part included in the Contractor's bid.
 - The Catalog Cut sheets shall be placed in the same order as shown on the spreadsheet.
 5. Copies of the Manufacturer's Certification for a minimum of the Project Forman and 50% of the installation crew.
 6. Sample of Labeling Scheme. Contractor will provide a sample for each identifier to be used on this project. Labels are to be approved by Owner prior to printing.

- D. LEED/CHIPS/HPSA (when applicable to project provide additional submittal information)
1. Recycled content, segregated by pre- and post-consumer percentages.
 2. Rapidly renewable material content.
 3. VOC content
 4. Distances from site to follow material process locations.
 - Raw material harvest, collection or extraction
 - Product or component fabrication
 - Final material manufacture, if different than component fabrication

1.7 Equivalent Products

- A. Pre-Approved Equals:
1. All pre-approved products shall be listed in the relevant specification section.
- B. Contractors wishing to approve a system other than those specified in this document will be required to perform the following:
- Provide System specifications and cut sheets for all system components for the proposed new system(s).
 - Provide an itemized comparison to each of the system functions as described in this specification. Include in that document how the proposed system compares to the specified system described in this document on a line by line basis, using one of the following three criteria: “exceeds”/”matches”/”unequal”.
- C. All other products than those specifically address in the bid document that the Contractor is seeking approvals for must be *received* by the Owner’s Representative *no later than 5 business days before the bid date*. All Approved Equals will be published in addendum form prior to the bid date.
- D. Failure to received written approval for product installed that deviates from the products called for in this specification and/or on the project drawings will result in the contractor having to replace the unapproved materials and equipment with the originally specified products at no additional cost to the Owner.

- 1.8 All proposed system documentation must be sent to the Owner’s Representative via one of the following: mail, fax or email. The Contractor will include the project name, their contact information, and the specification section number that the proposed system is comparable to.

1.9 Acceptance and Warranties

A. Project Acceptance

1. The Owner and the Contractor shall accept the project as complete based on the following criteria:
 - Before executing any performance testing, the Contractor shall present a test plan to the Project Engineer for their approval.
 - The Contractor has completed all testing and delivered copies of all test results to the owner's representative.
 - All test results have been examined and approved by the Contractor and the Project Engineer.
 - Copies of all documentation required by this section have been delivered to the Project Engineer.
 - All punch list items are completed to the satisfaction of the Inspector-of-Record.
 - Manufacturer Warranty Certification Certificates are provided to the Owner.
2. Following completion and/or compliance with the requirements listed above, the Contractor shall issue a Notice of Completion confirming that the project is complete. A 45-day acceptance period shall begin immediately following the issuance of the Notice of Completion.
3. Minor failures shall be responded to at the Owner's discretion or within one business day.

B. Manufacturer Warranties

1. The installed 271000 structured wiring (as applicable for given cable media) system, including both inter-building and intra-building sub-systems, shall be warranted by a manufacturer for a 15-year period or greater. Lifetime warranty is the warranty period preferred by the Owner and will be given preference where applicable.
2. The warranty certified systems will be a complete system comprised of products from a single solution manufacturer, warranted to operate as a guaranteed system for the entire channel (cords, telecommunications outlet/connectors, cables, cross-connects, patch panels, etc.). The Solution Manufacturer shall administer a follow-on program through the Vendor to provide support and service to the purchaser, and a single extended warranty point of contact. 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.
3. The Contractor shall be responsible for correcting any problems and malfunctions that are warranty-related for the entire warranty period. In the event that a Contractor should not be in business at the time of an issue, the manufacturer shall be responsible for all corrections, if deemed the responsible party.

4. Copies of any extended material warranties shall be passed through to the Owner.
5. During the installation and up to the date of final acceptance, the Contractor shall protect all finished and unfinished work against damage and loss. In the event of such damage or loss, the Contractor shall replace or repair such work at no cost to the Owner or any other Trade Partnership working on the project.

END OF SECTION

COMMUNICATIONS INFRASTRUCTURE SYSTEM

PART 1 – GENERAL

1.1 Statement of Work

- A. This document describes the requirements for the contractors, products and installation relating to furnishing and installing Underground Ducts and Raceway systems. All systems described herein shall be governed by the Division 16000 specifications, should these two documents be in conflict the more stringent shall prevail.
- B. The locations of vaults and pull boxes on the drawings are approximate and reflect the best information available. The Contractor is responsible for locating all existing utilities within the areas to be excavated prior to excavation. Final location of all trenches, communications utility vaults, and pull boxes must be verified and signed off on by the Owner/Owner's Representative.
- C. The contractor shall furnish and install all work necessary to make compete systems, whether or not such details are mentioned in these specifications or shown on the drawings, but which are necessary in order to complete working systems, excepting those portions that are specifically mentioned therein or plainly marked on the accompanying drawings as being installed or supplied by others.

1.2 Contractor Qualifications/Quality Assurance

- A. Safety and Indemnity
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 "1.5 A. Safety & Indemnity".
- B. Contractor Qualifications
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 "1.5 B. Contractor Qualification".
- C. Quality Assurance
 - 1. Contractor shall comply with all requirements as specified in Section 270000 "1.5 C. Quality Assurance".
- D. Warranty
 - 1. Contractor shall comply with all requirements as specified in Section 270000 "1.8. Acceptance & Warranties".

1.3 Submittal Documentation

- A. The successful contractor shall provide their submittal package in accordance with the Section 01 20 00 1.06 Submittal Schedule, and Section 270000 "1.6 Submittal Documentation".

1.4 Equivalent Products

- A. All Products described and Part Numbers given in this Specification are those of Leviton, Berk-Tek, Superior Essex, and Cooper B-Line unless otherwise noted.
- B. Pre-Approved Equals:
1. Utility Vault Company, Christy Concrete, BES
 2. Hoffman, B-Line, Circle AW
 3. CARLON, Allied Tubing, MaxCell
 4. RANDL Inc , Thomas & Betts, Bridgeport, Appleton, Erico, Minerallac
 5. Wiremold, Hubbell
- C. Contractors wishing to approve a system other than those specified in this document shall do so in accordance with Section 270000 "1.7 Equivalent Products".

PART 2 – PRODUCTS

2.1 Pathways & Fittings

A. Communication Underground Boxes

1. Communication Pull Boxes

- Provide separate pre-cast concrete pull boxes, with lids labeled "communications" (for TV, telephone, data, security).
- Type equal to "Christy N16, N30, N40, N44" steel reinforced solid concrete box, concrete lid & 12" extension box shall be used. See project drawings for locations & additional requirements.
- Shall be constructed out of 3000 PSI steel reinforced concrete.
- Install on 6" gravel pad and provide drain. See project details for more info.
- Pull boxes in traffic areas and along roads shall be designed and installed for H20-44 loading.
- Pull boxes shall be located and provided with grade rings as necessary to ensure that water is drained from conduits.
- Pull boxes shall be installed to minimize surface drainage entry as follows:
 1. Pull boxes should not be located in paths or streets. If such location cannot be avoided, pull boxes should not be located in low spots or drainage channels.
 2. Pull boxes not located in paths or streets should be installed so that the top is approximately 2" above final grade.
- All pull boxes shall be installed with a mow strip minimum of 6".
- Non-slip lids shall be provided for pull boxes in sidewalk areas. Use concrete or fiberglass-no metal lids in sidewalks.
- Quantity: Contractor will provide pull boxes and covers in the sizes and quantities as shown on the drawings.

2. Communication Vaults

- Provide separate pre-cast concrete vault, with lids labeled "communications"

(for TV, telephone, data, intrusion alarm).

- Vaults shall be equipped with a cable racking on the long walls suitable to support large copper cables as called for on the design documents.
- Vaults shall include; Anchorage, Lifting Inserts and Racking Devices.
- All Vaults shall be equipped with traffic-rated lids with a locking mechanism. All lids shall have the identification marking of “Communications” permanently affixed to the cover.
- All pull boxes shall be installed with a mow strip minimum of 12”.
- Quantity: Contractor will provide vaults and covers in the sizes and quantities as shown on the drawings.
- Standard Vault size 24”x36”x36” equal to Old Castle 2436-STD
- Large Vault size 36”x60”x36” equal to Old Castle 3660-STD

3. Communication Vault Accessories
UNDERGROUND CABLE RACK

HOOKS Lite Duty Extension

- Formed from 3/16 inch steel
- Hot dipped galvanized per ASTM A123 / A153
- Smooth top surface to protect cables from damage
- Insulator 11A31 fits these hooks
- Part numbers Inwesco or equal

Catalog	Extension From
10A35	4
10A36	7-1/2
10A37	10
10A38	14
10A39	18

4. Heavy Duty Extension

- Formed from 10 ga. steel
- Hot dipped galvanized per ASTM A123 / A153
- Unique design locks hook into rack
- Part numbers Inwesco or equal

Catalog No.	Extension From Face of Rack (Inches)
10C38	14

5. J-Hook Cradle

- Curved design to cradle cable

- Available in fusion bonded epoxy coated steel
- Available in injection molded ABS plastic
- Steel used is 1/4 inch thick x 15/16 inch wide
- ABS plastic hooks are 1-3/8 inch wide
- ABS plastic hooks furnished with locking tab
- Part numbers Inwesco or equal

Catalog No.	Type	Diameter Of Curve
10A60	Coated Steel	2-1/2
10B60	Plastic	2-1/2
10A61	Coated Steel	5
10B61	Plastic	5

6. Surface-Mounted Entrance Cabinets Type 1 & 12

- The Contractor shall provide a minimum of a NEMA 1 type enclosure that meets the UL 50, File No. E27567: Type 1 NEMA/EEMAC Type 1 CSA, File No. LL42184: Type 1 IEC 60529, IP30 standards for indoor applications.
- The Enclosure shall be constructed from 16 awg galvanized steel, with a drip shield top and seam free side, front and back.
- The Enclosure shall have a “slip-on” removable front cover held in place with steel screws.
- Enclose shall incorporate pre-punched knockouts for standard trade size conduits up to 1”.
- The size of cabinets mounted on an outside wall to serve a smaller building shall be as indicated on the construction plans.
- Quantity: Contractor will provide boxes in the sizes and quantities as shown on the drawings.

7. Surface-Mounted Entrance Cabinets Type 3R and 4X

- The Contractor shall provide a minimum of a NEMA 3R type enclosure that meets the UL 50 for outdoor applications.
- The Enclosure shall be constructed from 16 awg galvanized steel, with a drip shield top and seam free side, front and back.
- The Enclosure shall have a “slip-on” removable front cover held in place with steel screws.
- Enclose shall incorporate pre-punched knockouts for standard trade size conduits up to 1”.
- The size of cabinets mounted on an outside wall to serve a smaller building shall be as indicated on the construction plans.
- Quantity: Contractor will provide boxes in the sizes and quantities as shown on the drawings.

B. Metallic Pull Boxes and Terminal Cans

1. NEMA Type 1 – Screw Cover Cans

- Used for indoor use only

- NEMA/EEMAC Type 1, IEC 60529, IP30
 - UL 50, 50E Listed; Type 1; File No. E27525, cUL Listed per CSA C22.2 No 40; Type 1; File No. E27525
 - 16, 14 or 12 gauge steel or plated steel
 - ANSI 61 gray polyester powder paint finish inside and out.
 - Minimum size 6x6x4
 - Pre-Approved Sizes
Hoffman ASE6X6X4, ASE10X10X4, ASE12X12X4, ASE18X12X4, ASE18X18X4
Hoffman ASE6X6X6, ASE10X10X6, ASE12X12X6, ASE18X12X6, ASE18X18X6, ASE24X18X6, ASE24X24X6
 - Provide “NK” for No Knock-Outs as required.
 - Provide “AFE” Flush Covers as required.
 - Provide “AFDF” Flush Doors on all cans in user accessible areas IE; Data Closets, Electrical Rooms, Janitor Rooms, and Mechanical Rooms.
 - Provide “ACLFDF” Lock Kits for all cans in student areas.
2. NEMA 3R Terminal Cans
- Used for outdoor use under-eave, breezeway or parapet
 - NEMA/EEMAC Type 3R, IEC 60529, IP32
 - UL 50, 50E Listed; Type 3R; File No. E27567, cUL Listed per CSA C22.2 No 94; Type 3R File No. E27567
 - 16 gauge galvanized steel
 - ANSI 61 gray polyester powder paint finish inside and out over galvanized steel.
 - Minimum size 12x12x6
 - Hoffman A12R126HCR, A18R186HCR, A20R208HCR, A30R308HCR
3. NEMA 4 Terminal Cans
- Used for outdoor use vertical or Horizontal under-eave, breezeway or parapet
 - 16 or 14 gauge steel (see table)
 - Seams continuously welded and ground smooth
 - Stainless steel door clamps on three sides of door
 - ANSI 61 gray polyester powder paint finish inside and out over galvanized steel.
 - Minimum size 16x16x6
 - Hoffman A16H16ALP, A20H20ALP, A24H24ALP, A36H24ALP

C. Conduit

1. Rigid Steel Conduit
- Rigid steel conduit shall comply with Underwriter's Laboratories UL-6 Specification, ANSI C80.1 and Federal specification WW-C-581E or latest revisions. Conduit shall be hot dip galvanized on the exterior, with zinc or enamel on the interior.
 - Couplings, locknuts, and all other fittings shall be galvanized or sheardized, waterproof and threaded type only. Rigid conduit shall terminate with two locknuts; one outside and one inside enclosures and specified bushings. No running threads or chase nipples shall be issued without approval.
 - Bushings shall be non-metallic for 1 inch and smaller and insulated metallic for conduits larger than 1 inch.

- Galvanized rigid steel conduits (GRC) may be used in all locations. For underground runs in direct contact with earth, conduit shall be wrapped in 10mil PVC tape or shall be factory PVC-over-GRS conduit.
 - Intermediate metallic conduit (IMC) may be used indoor and outdoor locations, not underground.
2. Electrical Metallic Tubing (EMT)
- EMT conduit shall comply with Underwriter's Laboratories UL 797, ANSI C80.3 and Federal Specification WW-C-563 or latest revision. EMT shall be galvanized or sheardized.
 - Couplings and connectors for EMT shall be galvanized or cadmium plated and shall be of the compression type requiring the tightening of a nut on a gland ring. No die cast type shall be allowed. All connections shall have permanent insulated throats.
 - Electrical metallic conduit (EMT) may be used indoor and outdoor locations, not underground, not in areas subject to physical damage, not in concrete slabs, not in hazardous areas, not in masonry walls.
3. Schedule 40 PVC:
- The minimum conduit trade size allowed for this project will 2". Contractor will increase to the next higher trade size if conduit fill ration will exceed 40%.
 - Conduit shall be Carlon or equal, rated for use with 90° C conductors, UL Listed or approved equal. Material shall comply to NEMA Specification TC-2 (Conduit), TC-3 (Fittings) and UL 651 (Conduit) and 514b (Fittings).
 - Conduit and fittings shall carry a UL label (Conduit - on each 10 foot length; Fittings - stamped or molded on each fitting).
 - Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. The markings shall be legible and permanent.
 - The Conduit shall be made from polyvinyl chloride compound (recognized by UL) which includes inert modifiers to improve weatherability and heat distortion. Clean rework material, generated by the manufacturer's own conduit production, may be used by the same manufacturer, provided the end products meet the requirements of this specification.
 - The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or Cables.
 - Conduit, fittings and cement shall be produced by the same manufacturer to assure system integrity.
 - Testing and Acceptance Criteria: Conduit and fittings shall be tested in accordance with the testing requirements defined in NEMA TC-2, NEMA TC- 3 and UL-651 and 514. The acceptance criteria shall be given in the same standards.
 - All conduit and fittings shall be solvent cemented in applications in accordance with instructions from the manufacturer.
 - Conduit Spacers
 - High impact spacers shall be used in all multi-conduit duct banks (five or

- more conduits). The spacers shall conform to NEMA TC-2, TC-6, TC-8, and ASTM F 512.
- Spacers shall be installed and secured following the manufacturer's suggested guidelines, the BICSI CO-OSP Manual, or TIA/EIA 578, whichever is more stringent.
4. Pipe hangers for individual conduits shall be factory made, consisting of a pipe ring and threaded suspension rod. The pipe ring shall be malleable iron, split and hinged, or shall be interlocked with the suspension rod socket.
 5. Pipe racks for a group of parallel conduits shall be galvanized structural steel preformed channels of length as required, suspended on threaded rods and secured thereto with nuts above and below the cross bar. All offsets shall be in the same plane and shall be parallel.
 6. Factory made pipe straps shall be one-hole malleable iron or two-hole galvanized clamps.
 7. Manufacturer: Appleton, Crouse-Hinds, B-Line, Unistrut, T&B, or an approved equivalent product.
 8. Conduit Terminations and Plugs
 - All conduits entering a vault or pullbox shall be equipped with a bell-end securely attached to the structure.
 - All metal conduits shall be equipped with a bushing or end collar to protect cable during placement.
 - All unused conduits placed on this project or cleaned and modified by the Contractor shall be equipped with reusable rubber or plastic expansion seal plugs in all utility vaults/pull boxes and within all buildings.
 9. Conduit Flexible Type
 - Flexible conduit "Steel Flex or Aluminum Flex" may only be used for attic j-box to device connection, where specified in the project drawings or with consent of the owner/consultant representative.
 - Liquidtight flexible conduit may only be used where specified in the project drawings or with consent of the owner/consultant representative.
 - GRC & IMC fittings shall be galvanized rigid steel threaded type. Provide insulated grounding bushings at all enclosures.
 - EMT fittings shall be die cast or steel set screw type for dry locations, die cast or steel compression type for wet locations. Provide insulated grounding bushings at all enclosures.
 - PVC fittings shall be schedule 40 or schedule 80, provide adapters at all enclosures and transitions to GRC, IMC or EMT conduits.
 - Flexible fittings shall be die cast or steel type.
 - Liquidtight fittings shall be steel compression type.
 - Provide insulated screw on bushings on all conduit connections.
 - Provide insulated push on bushings for all stubb-out conduits.
 - Quantity: Contractor will provide conduits in the sizes and quantities as shown on the drawings.

10. Textile Innerduct - MaxCell

- Made from White Polyester and Nylon resin polymer
- Standard Outdoor Textile Innerduct: Micro (33mm), 2-inch, 3-inch and 4-inch single or multi-cell polyester/nylon textile innerduct containing 1250lb polyester flat woven pull tape.
- Detectable Outdoor Textile Innerduct: Micro (33mm), 2-inch, 3-inch and 4-inch single or multi-cell polyester/nylon textile innerduct containing 1250lb polyester flat woven pull tape, and a solid copper, polyvinyl color coated conductor (19AWG minimum) for tracing and rated for a minimum of 6 amps and 600 volts. Conductor shall be placed in the sidewall edge fold of the textile sleeve.
- Indoor Textile Innerduct (Riser-listed): Micro (33mm), 2-inch, 3-inch and 4-inch single or multi-cell nylon textile innerduct containing 1250lb polyester flat woven pull tape which meets UL2024A for flame propagation and smoke density values for general applications.
- Plenum-Listed Textile Innerduct: Micro (33mm), 2-inch and 3-inch single or multi-cell nylon textile innerduct containing 200lb nylon-resin flat woven pull tape which meets UL2024A for flame propagation and smoke density values for use in air handling spaces.
- Conduit Plugs: Compression-type conduit plugs with locking nuts for sealing and securing one or more textile innerducts within a 4-inch inside diameter conduit, e.g.: 4-inch plug with nine holes for cables in a 3 pack (9-cell) configuration
- Termination Bags: Inflation-type bags for sealing and securing around one or more textile innerducts and cables within 2-inch outside diameter or larger conduit.
- Pull Tape: measuring and pulling tape constructed of synthetic fiber, printed with accurate sequential footage marks. Color-coded.
- Duct Water Seal: products suitable for closing underground and entrance conduit openings where innerduct or cable is installed, to prevent entry of gases, liquids, or rodents into the structure.
- Approved Textile Innerduct #'s MXC4003, MXR4003 MXC3456, MXP3456, MXR3456 MXC2003, MXP2003, MXR2003 MXC2002, MXP2002, MXR2002

D. Duct Bank Locating Cable (Detectable Warning Tape)

1. Warning tape

- Warning Tape shall be a minimum of 3" wide, orange in color, 4 mils thick, and shall have an imprint as follows:
- "Caution Telephone Cable Buried Below" or,
- "Caution Fiber Optic Cable Buried Below"

E. Inter-duct

1. Plenum

- White or orange Kynar PVDF Resin, a fluoropolymer compound.
- Plenum rated flexible optical fiber/communication raceway.
- Provide wire management in a building for fiber optic and data and

communications cabling.

- Recognized per CEC Articles, 770 and 800 for Plenum, Riser and General Purpose Raceway for optical fiber, and telecommunications cables.
- UL Listed
- Meets UL 910 standards for Plenum Optical Fiber/Communications raceways.
- Provide all fittings to form a complete integrated raceway system.
- Extrude raceway from precision extruded PVDF resin
- 1"-2" diameter raceway shall have a 1/4" wide 1250 lb. tensile pull tape preinstalled.
- Shall be available in 3/4" through 2" diameters.
- Footage shall be sequentially marked.
- Threaded Aluminum Coupling: Molded Aluminum fitting which connect two pieces of corrugated tubing equipped with threaded ends.
- Quick-Connect Couplings: Molded Part which allows two pieces of 1" diameter corrugated tubing to be quickly snapped together. Available only in 1" diameter.
- Quick-Connect Threaded Male Adapters: Molded fitting which quickly snaps onto a 1" diameter piece of corrugated tubing to produce a threaded end. Available only in 1" diameter.
- Quick-Connect Male Snap-In Adapters: Molded fitting which snaps onto a 1" diameter piece of corrugated tubing to connect to an outlet or switch box. Available only in 1" diameter.
- Metallic Terminal Adapters: Molded metal part which allows a piece of corrugated tubing to connect to metallic conduit and metallic boxes.
- Spool Length: Varies, contractor shall field verify prior to ordering.
- Color: Orange
- Part #: Carlon
 - 3/4" CE4X1-1000
 - 1" CF4X1C-1000
 - 1-1/4" CG4X1C-900
 - 1-1/2" CH4X1C-1200
 - 2" CJ4X1C-1400

2. Riser

- Orange polyvinyl chloride (PVC)
- Riser rated Flexible Optical Fiber/Communication Raceway.
- Provides wire management for fiber optic and data and communications cabling in Riser applications and/or General Purpose applications within a building or for direct burial or concrete encasement.
- Recognized per CEC Articles, 770 and 800 for Plenum, Riser and General Purpose applications for optical fiber, and telecommunications cables.
- UL Listed
- Listed under UL 1666 - Standard for Riser Application for Optical Fiber Raceway.
- Provide all fittings to form a complete integrated raceway system.
- Fabricate Raceway from precision extruded PVC resin.
- Kevlar_ pull tape can be preinstalled in the 1" through 2" diameter.
- The footage shall be sequentially marked.

- Shall be available in 3/4" through 2" diameters.
 - Threaded Aluminum Coupling: molded Aluminum fitting which connect two pieces of corrugated tubing equipped with threaded ends.
 - Quick-Connect Couplings: Molded Part which allows two pieces of corrugated tubing to be quickly snapped together. Available only in 1/2"-1" diameter.
 - Quick-Connect Threaded Male Adapters: Molded fitting which quickly snaps onto a piece of corrugated tubing to produce a threaded end. Available only in 1/2"-1" diameter.
 - Quick-Connect Male Snap-In Adapters: Molded fitting which snaps onto a piece of corrugated tubing to connect to an outlet or switch box. Available only in 1/2"-1".
 - Metallic Terminal Adapters: Molded metal part which allows a piece of corrugated tubing to connect to metallic conduit and metallic boxes.
 - Schedule 40 Fittings: Molded fitting that is solvent cemented to the raceways. Schedule 40 fittings are commonly used with PVC Schedule 40 rigid conduit.
 - Spool Length: Varies, contractor shall field verify prior to ordering.
 - Color: Orange
 - Part #: Carlon
 - 3/4" DE4X1-1000
 - 1" DF4X1C-1000
 - 1-1/4" DG4X1C-900
 - 1-1/2" DH4X1C-1200
 - 2" DJ4X1C-700
3. General Purpose for use in Underground Conduit
- Orange polyvinyl chloride (PVC)
 - General Purpose is nonmetallic flexible raceway for use in General Purpose applications only. It is UL Listed and available with tape pre- installed.
 - General Purpose raceway is listed to UL 2024 in accordance with the California Electrical Code per Articles 725, 770, 800 and 820 for General Purpose and other cabling optical fiber/telecommunication applications.
 - For use in General Purpose areas per Articles 725, 770, 800 and 820 of the CEC.
 - Available in sizes 3/4" through 2"
 - Pull tape can be factory pre-installed in 1" through 2"
 - Outside Diameters meet IPS Dimensions
 - Footage sequentially marked
 - Spool Length: Varies, contractor shall field verify prior to ordering.
 - Color: Orange
 - Part #: Carlon
 - 1" BF4X1B-8000
 - 1-1/4" BG4X1B-5600
 - 1-1/2" BH4X1B-4500
 - 2" BJ4X1B-8000

F. Outlet Boxes

1. Outlet boxes (voice, data and audio visual)
 - All boxes shall be 5 in. Square x 2.875 in. Deep Metal Box with Cable Management minimum. As required provide 4-11/16" square by 2-1/8" deep.
 - Volume: 64 in³ (1050 cm³)
 - Side Knockouts: (1) 1" & (1) 1-1/4" each side
 - Listing: C ETL US; for use on Class 2 and Class 3 Remote-Control, Signaling and Power-Limited Circuits only.
 - Provide ****varied depth**** mud ring as required to allow no more than 1/8" gap between wall materials.
 - Any unused outlet or j-box shall be equipped with a blank cover.
 - Approved Outlet box shall be RANDL Inc. T-55 series
2. Outlet boxes (wall phone, microphone and other devices)
 - All boxes shall be 4-11/16" square by 2-1/8" deep minimum.
 - Provide ****varied depth**** mud ring as required to allow no more than 1/8" gap between wall materials.
 - Any unused outlet or j-box shall be equipped with a blank cover.
3. Junction boxes
 - All boxes shall be 4-11/16" square by 2-1/8" deep minimum.
 - Provide ****varied depth**** mud ring as required to allow no more than 1/8" gap between wall materials.
 - Any unused outlet or j-box shall be equipped with a blank cover.
4. Surface Mount boxes
 - base has rectangular KO to enable extension from existing single-gang flush wall box and 1/2" and 1" trade size concentric KOs.
 - Accepts NEMA Faceplates
 - one-gang - 4 3/4" H x 3" W x 2 3/4" D equal to Wiremold # 2344
 - two-gang - 4 3/4" H x 4 7/8" W x 2 3/4" D equal to Wiremold # 2344-2

G. Floor Boxes

1. Floor boxes provide the interface between power and communication cabling in an on-grade or above-grade concrete floor where power and communication services are required. Boxes shall provide flush or recessed device outlets that will not obstruct the floor area.
2. Provide floor boxes approved for use in concrete floor construction. Boxes shall be approved for above grade (stamped steel) and on grade (cast iron) applications. Floor boxes shall have been examined and tested by Underwriters Laboratories Inc. to meet UL514A and Canadian Standard C22.2 and shall bear the appropriate label. Floor boxes shall conform to the standard set in the California Electrical Code. Multi-compartment box shall have been evaluated by UL to meet the applicable U.S. and Canadian safety standards for scrub water exclusion when used on tile, terrazzo, wood, and carpet covered floors.
3. Boxes shall be available in one-, two-, or three-gang configurations or a single unit with four independent wiring compartments and available in stamped steel and cast iron versions. Boxes shall be rectangular in shape and available in deep and shallow versions. Boxes shall provide pre- and post-pour adjustments.

Multiple gang boxes shall also provide a removable barrier between the individual compartments for greater capacity when required.

4. Multi-Compartment Boxes: Floor boxes shall be manufactured in stamped steel or cast-iron. Box shall be available in shallow version for stamped steel or cast-iron types and deep version for stamped steel type only. Box shall have four independent wiring compartments that allow up to 4 duplex receptacles and/or communications services.
 - Boxes shall permit a tunneling feature that will allow internal wiring to various compartments. The box shall provide various size conduit openings.
 - Boxes shall be fully adjustable, providing a maximum of 1-7/8 inch pre-pour adjustment, and a maximum of 3/4 inch post-pour adjustment.
 - Boxes shall provide a series of device mounting plates that will accept both duplex power devices, as well as plates that will accommodate connectivity outlets and modular inserts. Where indicated, provide connectivity outlets and modular inserts by Ortronics or approved equal.
 - Activation covers shall be die-cast aluminum. Cover finish shall be one of the following, as selected:
 - a. textured aluminum finish.
 - b. Powder coat finish, color shall be Black.
 - c. Powder coat finish, color shall be Brass,
 - Activation covers shall be available in flanged or flangeless versions as selected. Covers shall be available with options for tile or carpet inserts, blank covers, or covers with one or two 1 inch liquid tight openings for furniture feed applications as applicable.
 - Pre-Approved Floor boxes shall be equal to Wiremold RFB-4 & RFB-9 series boxes.
 - Contractor shall provide all required entrance fittings & adapter plates for scope of work depicted.

H. Surface mount raceway “SMR”

1. Non-metallic raceway is an enclosed pathway used for surface distribution of branch circuit electrical wiring, and cabling for voice, data, multi-media, low voltage, and optical fiber. Raceway is typically installed in existing building structures, or after construction is complete. A complete raceway system includes raceway, covers, mounting hardware, various fittings, and outlet boxes installed at specific locations. Specific codes and standards apply to electrical wires and telecommunications cables that are deployed within non-metallic raceway. Codes that are enforced by the local Authority Having Jurisdiction (AHJ) must be observed during construction.
 - Assembly and disassembly of raceway base, cover, and fittings shall require no special tools.
 - Installed fittings shall be designed to overlap the raceway junction to cover exposed or uneven edges.
 - Security caps shall provide enhanced tamper protection by installing over the assembled raceway in desired locations.

- Raceway shall be designed to accept inline device boxes with either horizontal or vertical faceplate orientations.
 - Device boxes shall have a removable knockout portion to permit raceway entry and exit. Device boxes shall serve as an extension box by removing a single knockout.
 - Device boxes shall be available in standard NEMA single, double, and 3-gang versions. Device box color shall match raceway color.
 - Device boxes shall accommodate various faceplates that accept modular connector inserts or bezels for balanced twisted pair, fiber optic, coaxial, multi-media, and other low voltage cabling connectors.
 - Faceplates for device boxes shall accommodate pre-printed labels for proper electrical identification, or telecommunications port identification according to ANSI/TIA/EIA-606-A.
 - Faceplates shall be available in colors that match the device box and raceway.
 - Category rated communications jacks installed in surface box faceplates shall have provisions for snap-in icons for further identification.
2. 5400 Series
- The raceway shall be a two-piece design with a base and snap-on covers. The raceway base shall accept both a single cover that spans the entire base or two individual TwinSnap™ covers. Total width shall be 5.25" [133mm] by 1.75" [44.5mm] deep with an approximate thickness of .095" [2.4mm]. The base and cover shall be available in 8' [2.4m] lengths. The raceway shall be available with two (5400TB) or three (5400TBD) wiring channels. **VERIFY WITH OWNER BEFORE USING ANY RACEWAY. IT IS ALWAYS PREFERRED TO HAVE CABLING CONCEALED IN THE WALLS.**
 - The 5400TB Series Base shall have two wiring channels separated by one integral barrier. Each channel must be large enough to accept standard power and communication devices without restricting capacity of the adjacent channel. The 5400TBD Series Base shall have three wiring channels separated by two integral barriers forming 1/2, 1/4, and 1/4 compartments. One channel must be large enough to accept standard power and communication devices without restricting capacity of the other channels. The 5400C Series Cover shall span the entire width of the base concealing all of the wiring channels. The 5400TC Series Cover shall have flanges for snapping onto the base side walls and center barrier. The cover shall span one-half the width of the base, providing independent access to services.
 - A complete line of full capacity corner elbows and tee fittings must be available to maintain a controlled 2" [51mm] cable bend radius which meets the specifications for Fiber Optic and UTP/STP cabling and exceeds the TIA / EIA 569-A requirements for communications pathways. They shall be manufactured of a rigid PVC compound. A full complement of fittings must be available including, but not limited to tees, entrance fittings, cover clips, and end caps. They shall be manufactured of a rigid PVC compound. The fittings shall have a matte texture, in ivory or white colors to match the base and cover. They shall overlap the cover and base to hide uneven cuts. All fittings shall be supplied with a base where applicable to eliminate mitering.

A transition fitting shall be available to adapt to other Wiremold series raceways.

- Device brackets shall be available for mounting standard devices in-line or offset from the raceway. A device bracket shall provide up to three single-gang openings at one location. Faceplates shall be 5507 Series that match and fit flush in the device plate. They shall be manufactured of rigid PVC compound.
- The raceway manufacturer will provide a complete line of connectivity outlets and modular inserts for UTP, STP (150 ohm), fiber optic, coaxial and other cabling types with faceplates and bezels to facilitate mounting. A complete line of preprinted station and port identification labels, snap-in icon buttons, as well as write-on station identification labels shall be available.
- If raceway does not exist and plans show raceway to be installed, verify with owner BEFORE any installation occurs. The Owner prefers all cables to be inside the walls, whenever possible. Verify with Owner on location Contractor believes raceway is required.

J. Cabling Support System

1. Telco Backboards

- Backboards shall be 4' x 8' x .75" void free plywood (ACX Plywood with the "A" side turned out).
- The plywood shall be painted with two coats of white fire retardant paint.
- Cut full size sheet to required size for application type.

2. J-Hooks

- Cable supports shall provide a bearing surface of sufficient width to comply with required bend radii of high-performance cables; cULus Listed.
- Cable supports shall have flared edges to prevent damage while installing cables.
- Cable support system shall provide fasteners that allow them to be mounted to wall, concrete, joist, tee-bar wire, treaded rod, beams and raised floor supports.
- Fasteners shall have the ability to either be factory or jobsite assembled; rated for indoor use in non-corrosive environments; cULus Listed.
- Fastener to with one non-continuous cable support, factory or jobsite assembled.
- Color: NA
- Quantity: Contractor will provide quantities of j-hooks and hanger accessories in the amount necessary to support all horizontal cabling every 14" – 28". The load per hook shall not exceed the Owner's 40% fill ratio. All hooks shall have a retainer clip installed as part of the hook. Verify with Owner as to what 40% fill is.
- Part#: ERICO CAT425, Cooper B-Line BCH12, BCH21, BCH32, BCH64 and accessories.

3. In-ceiling support brackets

- 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.

- 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.
- 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.
- 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.
- 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.
- Part #:
Leviton QuickPort In-Ceiling Bracket, rod/wire hanger, 49223-CBC Leviton QuickPort In-Ceiling Bracket, accepts beam and screw mounts, 49223-CB0 Leviton QuickPort In-Wall Bracket, 49223-BA5 (pack of 5)

K. Pull Rope

1. Pulling Ropes (Mule tape)

- Pull ropes shall be 1/2" flat tape with a minimum tensile strength of 1200 lbs.
- Ropes shall be pre-lubricated, woven polyester or aramid fiber tape made from low friction, high abrasion resistant yarns providing a low coefficient of friction. Tape shall be printed with sequential footage markings for accurate measurements.

2. Empty Conduits

- Pull rope shall be new 1/2" flat tape with a minimum 1200 lb. tensile strength.
- Every empty conduit shall be equipped with a pull rope secured to the duct plug at each end.

3. Installed with Cables:

- Pull rope shall be new 1/2" flat tape with a minimum 1200 lb. tensile strength.
- Contractor is required to install a pull rope into every conduit that they pull cabling in.

2.2 Fire Stop Systems

A. General

1. Sleeves shall be 2", 3" or 4" EMT or smaller. All cables penetrating walls must be sleeved.
2. Sleeves shall maintain a 40% conduit fill ratio.

3. Sleeves must be supported or attached at walls by apparatuses meant to do so. All sleeves shall be rigidly and properly supported.
4. Sleeves must extend past inaccessible areas.
5. Sleeves must be protected by a U.L. rated system at all firewalls designated on the construction drawings.
6. Fire stopping shall be a material, or combination of materials, to retain the integrity of time-rated construction by maintaining an effective barrier against the spread of flame, smoke, and gases. It shall be used in specific locations as follows:
 - Duct, cables, conduit, piping, and cable tray penetrations through floor slab and through time-rated partitions or fire walls.
 - Openings between floor slab and curtain walls, including inside hollow curtain walls at the floor slab.
 - Penetrations of vertical service shafts.
 - Openings and penetrations in time-rated partitions of fire walls containing fire doors.
 - Locations where specifically shown on the drawings or where specified in other sections of the Standards.
7. Fire stopping materials shall be asbestos free and capable of maintaining an effective barrier against flame, smoke, and gasses in compliance with requirements of ASTM E 814, and UL 1479. Only listed fire stopping material acceptable to State, County, and City codes shall be used.
8. The rating of the fire stops shall in no case be less than the rating of the time rated floor or wall assembly.
9. All Fire stopping Locations (FSL) shall be labeled within 12" of the fire stopping material on each side of the penetrated fire barrier. The format for the Fire stopping Location identifier shall display the Telecom Room floor number, the Fire stopping Location number, and the hour rating of the fire rating system (e.g. 1-FLS001 (2)). Each fire stopping location shall be identified with a fire stopping warning label. The label shall include the manufacturer of the product, the installer and company name, the UL number for the product, the rating of the material, the installation date, and the number and type of cables passing through the opening. The fire stopping warning label can include the fire stopping location identifier, eliminating the need for a separate label. Penetration modifications requiring the repair/re-installation of the fire stopping material require the addition of a new fire stopping warning label. No previous fire stopping warning labels shall be removed or obscured by new labels. In the event the penetration is completely cleaned of existing fire stopping material, and new material is installed, the previous label shall be removed or obscured completely.
10. Manufacturers; Specified Technologies Inc., 3M & Hilti
 - SSS - intumescent sealant

- SSP - putty and putty pads
- SSAMW - mineral wool
- IC 15WB+ - intumescent sealant
- CP 25WB+ - intumescent sealant
- Fire Barrier Moldable Putty+ - putty and putty pads
- FS-ONE - intumescent sealant
- CP 618 - putty and putty pads.

B. Single Entry System

- The fire stop system is comprised of the item or items penetrating the fire rated structure, the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure.
- Fire stop systems comprise an effective block for fire, smoke, heat, vapor and pressurized water stream.
- All penetrations through fire-rated building structures (walls and floors) shall be sealed with an appropriate fire stop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating item i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall use the proper fire stop equipment.
- Fire stop systems shall be UL Classified to ASTM E814 (UL 1479).
- Quantity: See Drawing for quantity and installation details.
- Part#: Equal to STI, PN# SSS100

C. Re-Enterable Fire Stop System

- The re-enterable fire stop system is comprised of the item or items penetrating the fire rated structure, the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure.
- No additional fire stopping material shall be required to obtain proper fire stopping.
- The system shall offer full fire resistance whether it is empty or 100% visually filled.
- The system shall be self-contained, and shall automatically adjust to differing cable loads.
- The system shall allow add, moves, and changes without additional materials.
- All penetrations through fire-rated building structures (walls and floors) shall be sealed with an appropriate re-enterable fire stop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating item i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall use the proper fire stop equipment.
- Fire stop systems shall be UL Classified to ASTM E814 (UL 1479).
- The system shall be gang-able using wall plates for additional capacity.
- Quantity: See Drawing for quantity and installation details.
- Part #: Equal to STI PN# EZDP33FWS STI PN# EZDP33WR

2.3 Grounding/Bonding Systems

A. Grounding and Bonding Equipment

1. Telecommunications Main Grounding Busbar (TMGB)
 - Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
 - The buss bar shall be 4" (100 mm) high and 12" (300 mm) long and shall have 18 attachment points (two rows of 9 each) for two-hole grounding lugs.
 - The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 15 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
 - The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
 - The busbar shall be UL Listed as grounding and bonding equipment.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Telecommunications Main Grounding Busbar: Part Number 40153-012, 12" x 4" (300 mm x 100 mm) Telecommunications Main Grounding Busbar, UL Listed.
2. Telecommunications Grounding Busbar (TGB)
 - Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
 - The busbar shall be 2" (50 mm) high and 10" (250 mm) long and shall have 7 attachment points (one row) for two-hole grounding lugs.
 - The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 4 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
 - The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
 - The busbar shall be UL Listed as grounding and bonding equipment.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Telecommunications Grounding Busbar: Part Number 13622-010, 10" x 2" (250 mm x 50 mm) Telecommunications Grounding Busbar, UL Listed.
3. Horizontal Rack Busbar
 - Horizontal rack-mount busbar shall be constructed of 3/16" (4.7 mm) thick by 3/4" (19.1 mm) high hard-drawn electrolytic tough pitch 110 alloy copper bar.
 - Bar shall be 19" EIA or 23" rack mounting width (as specified below) for mounting on relay racks or in cabinets.
 - Bar shall have eight 6-32 tapped ground mounting holes on 1" (25.4 mm) intervals and four 0.281" (7.1 mm) holes for the attachment of two-hole grounding lugs.
 - Each bar shall include a copper splice bar of the same material (to transition between adjoining racks) and two each 12-24 x 3/4" copper-plated steel

- screws and flat washers for attachment to the rack or cabinet.
 - Bar shall be UL Listed as grounding and bonding equipment.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Horizontal Rack Busbar: Part Number 10610-019, Ground Bar for 19" Rack.
4. Two Mounting Hole Ground Terminal Block
- Ground terminal block shall be made of electroplated tin aluminum extrusion.
 - Ground terminal block shall accept conductors ranging from #14 AWG through 2/0.
 - The conductors shall be held in place by two stainless steel set screws.
 - 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.
 - Ground terminal block shall be UL Listed as a wire connector.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Two Mounting Hole Ground Terminal Block:
 - Part Number 40167-001, Two Mounting Hole Ground Terminal Block, 1 each
 - Compression Lugs
 - Compression lugs shall be manufactured from electroplated tinned copper.
 - Compression lugs shall have two holes spaced on 5/8" (15.8 mm) or 1" (25.4 mm) centers, as stated below, to allow secure two bolt connections to busbars.
 - Compression lugs shall be sized to fit a specific size conductor, sizes #6 to 4/0, as stated below.
 - Compression lugs shall be UL Listed as wire connectors.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Compression Lugs:
 - Part Number 40162-901, Compression Lug, #6 Awg, 5/8" (15.8 mm) hole spacing, 1 each.
 - Part Number 40162-903, Compression Lug, #6 Awg, 1" (25.4 mm) hole spacing, 1 each.
 - Part Number 40162-904, Compression Lug, #2 Awg, 5/8" (15.8 mm) hole spacing, 1 each.
 - Part Number 40162-907, Compression Lug, #2 Awg, 1" (25.4 mm) hole spacing, 1 each.
 - Part Number 40162-909, Compression Lug, 2/0 Awg, 1" (25.4 mm) hole spacing, 1 each.
 - Part Number 40162-911, Compression Lug, 4/0 Awg, 1" (25.4 mm) hole spacing, 1 each.
5. Antioxidant Joint Compound
- Oxide inhibiting joint compound for copper-to-copper, aluminum-to-aluminum or aluminum-to-copper connections.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Antioxidant Joint Compound:

- Part Number 40168-101, Antioxidant Joint Compound, Copper-to-Copper Connections, .5 oz, 1 each.
 - Part Number 40168-801, Antioxidant Joint Compound, Copper-to-Copper Connections, 8 oz, 1 each.
 - Part Number 40166-101, Antioxidant Joint Compound, Aluminum-to-Aluminum or Aluminum-to-Copper Connections, .5 oz, 1 each.
 - Part Number 40166-801, Antioxidant Joint Compound, Aluminum-to-Aluminum or Aluminum-to-Copper Connections, 8 oz, 1 each.
 - Part Number 40168-150, Antioxidant Joint Compound, Copper-to-Copper Connections, .5 oz, 50 each.
 - Part Number 40168-812, Antioxidant Joint Compound, Copper-to-Copper Connections, 8 oz, 12 each.
 - Part Number 40166-150, Antioxidant Joint Compound, Aluminum-to-Aluminum or Aluminum-to-Copper Connections, .5 oz, 50 each.
 - Part Number 40166-812, Antioxidant Joint Compound, Aluminum-to-Aluminum or Aluminum-to-Copper Connections, 8 oz, 12 each.
6. C-Type, Compression Taps
- Compression taps shall be manufactured from copper alloy.
 - 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
 - Compression taps shall be sized to fit specific size conductors, sizes #2 AWG to 4/0, as stated below.
 - Compression taps shall be UL Listed.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Compression Taps:
 - Part Number 40163-001, Compression Tap, #6 AWG Solid Run to #6 AWG Solid Tap, 1 each.
 - Part Number 40163-007, Compression Tap, 2/0 Stranded Run to 2/0 Stranded Tap, 1 each.
7. Pipe Clamp With Grounding Connector
- Pipe clamp shall be made from electroplated tinned bronze. Installation hardware will be stainless steel.
 - 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.
 - Pipe clamp installation hardware shall be sized to attach to pipes, sizes 1" to 6" (.75" to 6.63" in diameter), as stated below.
 - Pipe clamp shall be UL Listed as grounding and bonding equipment.
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Pipe Clamps:
 - Part Number 40170-002, Pipe Clamp, for 1" to 1-1/4" pipe, 1 each.
 - Part Number 40170-003, Pipe Clamp, for 1-1/2" to 2" pipe, 1 each.
 - Part Number 40170-004, Pipe Clamp, for 2-1/2" to 3" pipe, 1 each.
 - Part Number 40170-005, Pipe Clamp, for 3-1/2" to 4" pipe, 1 each.
 - Part Number 40170-006, Pipe Clamp, for 5" to 6" pipe, 1 each.

8. Equipment Ground Jumper Kit
 - 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 ounce tube of antioxidant joint compound.
 - Ground conductor is an insulated green/yellow stripe #6 AWG wire
 - Lugs are made from electroplated tinned copper and have two mounting holes spaces .5” to .625” apart that accept 1/4” screws.
 - Jumper will be made with UL Listed components
 - Design Make shall be:
 - Chatsworth Products, Inc. (CPI),
 - Equipment Ground Jumper Kit:
 - Part Number 40159-010, Equipment Ground Jumper Kit, 1 each.

B. Communications raceways, backboards and rack systems

1. The conduit system must be permanently and effectively grounded, in accordance with Title 24 of the California Code of Regulations, California Electric Code #250, and National Electric Code or as required by local AHJ. If in confusion or conflict the most stringent specification shall apply.
2. Provide as a minimum a #1/0awg THHN conductor in conduit from the main building grounding point to a 1/4” x 4” x 5.25” telecommunications grounding bus bar(TGB) at every backboard.
3. Provide as a minimum #6awg green THHN conductor from each equipment rack, cable tray or wall mounted equipment to a TGB.

PART 3 – EXECUTION

3.1 General

A. Permits and Licensing

1. Contractor is responsible to procure all necessary permits before the commencement of their work to the city or state agencies as required. It is the contractor’s responsibility to provide all documentation to the AHJ.
2. Contractor is responsible to procure all necessary licenses for the city or state they are commencing the work in, before the commencement of their work begins.
3. Contractor to procure all encroachment permits as it pertains to the work described in these documents.
4. No person may access or enter in any way, an underground vault or confined space without the training, staff, and safety equipment defined on the confined

space permit. Accessing these spaces without a valid permit or without the required support services will be cause for an order to stop work until all violations are resolved and may result in a fine or suspension of the workers involved.

B. Safety

1. All federal (OSHA), state, and local safety rules, will be enforced at all times during the duration of the project. It is the responsibility of the Contractor to conduct frequent inspections of the job site to ensure compliance.

3.2 Installation

A. INTRA-BUILDING PATHWAYS

A. COMMUNICATION VAULTS

1. Site Access
 - The general contractor shall be responsible for providing adequate access to the site to facilitate hauling, storage and proper handling of the precast concrete units.
2. Installation
 - Precast concrete units shall be installed to the lines and grades shown in the contract documents or otherwise specified.
 - Precast concrete units shall be lifted by suitable lifting devices at points provided by the precast concrete producer.
 - Precast concrete units shall be installed in accordance with applicable industry standards. Upon request, the precast concrete producer shall provide installation instructions.
 - Field modifications to the product shall relieve the precast producer of liability regardless if such modifications result in the failure of the precast concrete unit.
3. Watertightness
 - Where watertightness is a necessary performance characteristic of the precast concrete unit's end use, watertight joints, pipe-entry connectors and inserts should be used to ensure the integrity of the entire system.

B. CONDUIT

1. All conduit shall be routed parallel or perpendicular to walls.
2. All conduit shall be installed in accordance with NEMA "Standard of Installation" and shall meet applicable local and California building and electrical codes or regulations.
3. Conduit runs shall not exceed 100 feet or contain more than two 90-degree bends without utilizing appropriately sized pull boxes. No conduits may enter a pull box at a 90-degree angle. They are not to be installed into the side of a pull box. All conduits must enter the ends of the pull box.

4. All conduits entering a building from outside shall be plugged with reusable stoppers to eliminate the entrance of water or gases into the entrance room. Building entrance conduits shall slope downward away from the building to reduce the potential of water entering the building. All building penetrations are to be sealed from wall to wall and on the outside and inside of the penetrations.
5. All conduits penetrating a fire or smoke barrier shall be fully sealed between the conduit and the actual penetration following manufacturer's recommendations.
6. Contractor shall label each fire stop location with the manufacturer's identification number of the product used and shall provide the inspector copies of each products system configuration.
7. No communications outlet boxes shall be "daisy-chained." Each communications outlet shall be served by a separate 1-inch (minimum) conduit.
8. In rooms with a drop or false ceiling, communications outlets shall be served by a 1-inch conduit stubbed six inches above the false ceiling, angled toward the cable tray or open access area, and be equipped with a compression fitting and plastic bushing. All stubs shall be marked "Comm".
9. All conduit shall be equipped with an approved water or barrier seal in building access points.
10. All conduits which utilize fabric mesh innerduct, will have the innerduct installed first, and then the appropriate cables installed within the channels of the innerduct.
11. No communications conduit shall contain more than 180 degrees of bend without the use of a pullbox. Pullboxes must be approved by Engineer of Record to ensure proper sizing and conduit entry placement.
12. In areas where hard lid ceilings are in place, all conduits are to run to accessible location or to cable tray.
13. Provide labels at both ends of conduits to identify location of far end.

C. STATION CABLE SUPPORT SYSTEM

1. All station cable support systems shall be braced for zone four seismic activity.
2. In suspended ceiling and raised floor areas where duct, cable trays, or conduit are not available, station cables shall be bundled with Velcro straps at appropriate distances.
3. Velcro straps shall not be over tightened to the point of deforming or crimping the cable sheath.
4. Velcro straps shall be UL listed, rated for low smoke, and certified for use in a plenum environment.
5. The station cable support system components shall be firmly attached to the existing building structure and installed not more than five feet apart.
6. The station cable support system components shall be installed to provide at least three (3) inches of clear vertical space between the cables/optics and the ceiling tiles.
7. The station cable support system components shall be spaced to prevent the cables/optics from sagging or buckling.
8. No more than eighteen (18) Category 6 cables shall be supported by a J - hook.
9. No more than thirty (30) Category 6 cables shall be supported by triangular galvanized metal bracket.
10. The station cable support system shall be clearly and neatly labeled per

TIA/EIA 606-A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

D. Raceways

1. All dual channel raceway shall be installed with a complete end-to-end channel for future power service installation.
2. The raceway shall be stubbed above the false ceiling space and capped so that each section of raceway can be connected to a power service in the future without a requirement to add raceway to visible portions of the system. If no false ceiling space is available, the power channel is to be stubbed up and capped next to the point at which the communication services enter the room.

E. Cable Tray

1. The Contractor will be responsible for placement of the cable tray in concert with other trades, allowing sufficient room for the cable installers to gain access to all portions of the tray system. Cable tray location shall be coordinated with open ceiling areas, access panel locations, and feeder conduit positions to provide an accessible cable pathway throughout the facility.
2. All metallic trays must be grounded and may be used as a ground conductor. Provide #2 AWG bare copper equipment grounding conductor through entire length of tray; bond to each component. Trays used as an equipment grounding conductor must be clearly marked.
3. Trays shall be bonded end-to-end.
4. Trays shall enter distribution rooms a minimum of six inches into the room, then utilize a drop out to protect station cables from potential damage from the end of the tray.
5. Cable trays shall be placed a minimum of six (6) inches from any overhead light fixture and twelve (12) inches from any electrical ballast. A minimum of eight (8) inches of clearance above the tray shall be maintained at all times. All bends and T-joints in the tray shall be fully accessible from above (within 1 foot). Trays shall be mounted no higher than twelve (12) feet above the finished floor and shall not extend more than eight (8) feet over a fixed ceiling area.
6. A separate conduit sleeve (minimum of four inches) must be provided as a pathway through any wall or over any obstruction (such as a rated hallway) from the cable tray into any room having a communications outlet.
7. The Contractor shall fire stop around the tray and, after installation of the cables, within the tray using removable pillow-style products following manufacturers' guidelines. Sound deadening material shall be provided and installed after installation of cable.
8. In rooms without a drop ceiling (open to the structure), the cable shall be mounted as high as possible to provide the greatest clearance above the finished floor, but within the limits in (e) above.

F. Wire Mesh Cable Tray

1. Provide all components of the tray system (tray, supports, splices, fasteners, and accessories) from a single manufacturer.

2. Wire mesh cable tray shall be secured to the structural ceiling, building truss system, wall or floor using manufacturer's recommended supports and appropriate hardware as defined by local code or the authority having jurisdiction (AHJ).
3. When the pathway is overhead, wire mesh cable tray shall be installed with a minimum clearance of 12" (300 mm) above the tray. Leave 12" (300 mm) in between the tray and ceiling/building truss structure. Multiple tiers of wire mesh cable tray shall be installed with a minimum clearance of 12" (300 mm) in between the trays. When located above an acoustical drop ceiling, wire mesh cable tray shall be installed a minimum of 3" (75 mm) above the drop ceiling tiles.
4. When installed under a raised floor, wire mesh cable tray shall be installed with a minimum 3/4" (19 mm) clearance between the top of the tray and the bottom of the floor tiles or floor system stringers, whichever are lower in elevation. Maintain a 3" (75 mm) clearance between trays wherever trays cross over.
5. Wire mesh cable tray shall be supported every 6' (1.8 m) of span or less. Support wire mesh cable tray within 2' (0.6 m) of every splice and intersection. Support intersections on all sides. Support wire mesh cable tray on both sides of every change in elevation/direction. The weight of the load on the cable tray must not exceed the stated limits per span in the manufacturer's published load table. Use additional supports where needed.
6. Secure wire mesh cable tray to each support with a minimum of one fastener. Follow the manufacturers' recommended assembly, splice and intersection-forming practices.
7. Use installation tools and practices recommended by the manufacturer to field fabricate wire mesh cable tray intersections and changes in elevation. Use side-action bolt cutters with an offset head to cut wire mesh cable tray.
8. Wire mesh cable tray shall be bonded to the Telecommunications Grounding Busbar (TGB) using an approved ground lug on the wire basket tray and a minimum #6 grounding wire or as recommended by the AHJ. Follow UL
9. Classified splicing methods recommended by the manufacturer, ground the tray per CEC requirements and verify bonds at splices and intersections between individual cable tray sections. Cable pathway should be electrically continuous through bonding and attached to the TGB.
10. The quantity of cables within the tray will not exceed a whole number value equal to 50% of the interior area of the tray divided by the cross-sectional area of the cable. Cable fill will not exceed the depth of the cable tray's side rail [2" (50 mm), 4" (100 mm) or 6" (150 mm)].
11. The combined weight of cables within the tray will not exceed stated load capacity in manufacturer's specifications.
12. Separate different media type within the tray. Treat each type of media separately when determining cable fill limits.
13. When pathways for other utilities or building services are within 2' (0.6 m) of the wire mesh cable tray, cover the tray after cables are installed.

G. Pull boxes

1. Pull boxes shall be installed in easily accessible locations.
2. Pull boxes installed as part of a horizontal cabling pathway shall be installed

immediately above suspended ceilings, where possible.

3. Pull boxes shall not be used for splicing cable.
4. Pull boxes shall be placed in conduit runs that exceed 100 feet or which require more than two 90 degree bends. The pull boxes shall be located in straight sections of conduit and must not be used for a right angle bend. Installation shall allow cable to pass through from one conduit to another in a direct line.
5. Pull boxes must have a length at least 12 times the diameter of the largest conduit.

B. EXISTING OUTLET BOXES, RACEWAYS, AND CONDUITS

- A. Existing recessed boxes and concealed station conduits may only be re-used as a pathway for a new outlet per the criteria below:
1. Existing recessed single-gang box with a $\frac{3}{4}$ inch diameter station conduit: One new voice or data outlet (1 cable maximum).
 2. Existing recessed single-gang outlet with a 1 inch diameter station conduit: One new voice/data outlet or one new voice/data/fiber outlet. (3 cables maximum) (Only acceptable in offices and classrooms where wire cannot be fished in existing walls.) For outlets with fiber cable terminations, faceplates must be equipped with a spool to provide for a maintenance loop per manufacturer's specifications.

C. GROUNDING AND BONDING SYSTEMS

A. Grounding and bonding - GENERAL

1. Installation: The Contractor shall provide grounding and bonding in accordance with the requirements of CEC, IEEE 142, TIA/EIA 568, TIA/EIA 607, state and local codes, the campus standards and to requirements specified herein. Codes shall be complied with as a minimum requirement, with these specifications prevailing when they are more stringent.
2. Bonding
 - (a) Metallic conduits, wireways, metal enclosures of busways, cable boxes, equipment housings, cable racks and all non-current carrying metallic parts of the installed telecommunications services shall be grounded with #6 AWG copper wire. The metallic conduit system shall be used for equipment and enclosure grounding but not as a system ground conductor.
 - (b) All metallic conduit stub-ups shall be grounded, and where multiple stub-ups are made within an equipment enclosure, they shall be equipped with grounding bushings and bonded together and to the enclosure and the enclosure ground bus.
 - (c) Each metallic raceway, pipe, duct and other metal object entering the buildings shall be bonded together. The Contractor shall use #6 AWG bare copper conductors.
 - (d) The Contractor shall bond telecommunications equipment and busbars separately.

B. Signal Reference Grounding and Bonding

1. Each identified telecommunications space within a building shall have a common signal reference ground. The signal reference ground shall conform to the following:
 - (a) Within the building, all communication spaces shall be separately bonded to each other and connected to the primary building ground in accordance with the provisions of TIA/EIA 607. The communication ground shall not ground any other equipment or be connected to any potential high voltage source. All racks, frames, drain wires, and all installed communication equipment shall only be grounded to this common reference ground with a minimum size #6 AWG copper wire.
 - (b) The Contractor shall provide, as a minimum, a continuous #3/0 AWG green electrical conductor connected to a 1/4" x 4" x 5.25" telecommunications grounding bus bar (TGB) 6" AFF on the plywood backboard of each IDF (or telecommunication space) to terminate chassis and other equipment grounds.
 - (c) The ground wires from each individual IDF shall be routed directly to the Building Distribution Frame (BDF), terminated and bonded together via a telecommunications main grounding bus bar (TMGB) of minimum 1/4" x 4" x 12" dimensions. This point of single reference for all closets in a building shall in turn be grounded with a minimum #3/0 AWG ground conductor to the main building ground. If a main building ground is unavailable, the ground wire from the BDF shall be grounded to the nearest electrical panel ground bus bar. The building ground for signal reference shall be the building service entrance ground.
2. Riser/Tie Cable Bonding
 - (a) There shall be no bonding between the entry cable and the inside riser or distribution cable.
 - (b) All riser and tie cable shields shall be bonded into a single continuous path end-to-end and grounded on each floor in which pairs leave the sheath. Cable shields shall be grounded to the signal reference ground provided in each telecommunication space.

C. Grounding and Bonding Testing and Inspection Procedures

1. As an exception to requirements that may be stated elsewhere in these documents, the Inspector of Record shall be given five (5) working days' notice prior to each test. The Contractor shall provide all test equipment and personnel and shall provide written copies of all test results.
2. Grounding and bonding system conductors and connections shall be inspected for tightness and proper installation.
3. The Contractor shall provide personnel and test equipment for point-to-point resistance tests before connecting equipment. Perform point-to-point tests in each building to determine the resistance between the main grounding system and all BDF/IDF ground bus bars. Investigate and correct point-to-point resistance values that exceed 0.5 ohm. The Contractor shall record resistance

measurements at all test point locations.

D. INFORMATION OUTLETS

A. GENERAL REQUIREMENTS

1. Station outlets shall be mounted securely at work area locations.
2. Station outlets shall be located so that the cable required to reach the desktop equipment is no more than 10 feet long.
3. Station outlets should not be “daisy-chained.”
4. Outlets shall be mounted as follows:
 - (a) Wall phone: 48 inches above the finished floor.
 - (b) Standard voice/data outlet: 15 inches above the finished floor.
 - (c) Wall-mounted video outlet: 78 inches above the finished floor.
 - (d) Counter top: 6 inches above the counter top.

B. MODULAR FURNITURE TELECOMMUNICATIONS OUTLETS

1. The Contractor shall provide and install all components and labor necessary to completely install, test, and document voice and data telecommunications outlets at each modular furniture workstation location.
2. Category 6 station cable shall be placed from the BDF, through the riser sleeves, through the cable tray system into the conduit, ceiling or floor poles, etc. into the furniture to be served.
3. The Contractor shall coordinate the telecommunications and electrical installation so that the modular furniture is served from the joint signal/power floor monuments or joint power pole in a consistent manner. The Contractor shall provide and install all fittings, flex conduit, adapter plates, and telecommunications cable and components necessary to install Category 6 station cable from the consolidation point box, through the ceiling or floor monument or pole, into the furniture raceway, and to the final user outlet location (including jacks, adapters, and faceplates).
4. The telecommunications installers shall coordinate with the electrical drawings for the number and location of user voice and data outlets.
5. Labels shall be numbered according to a scheme developed in consultation with the owner’s representative. Owner to approve label scheme prior to printing.

E. GROUNDING AND BONDING

1. The facility shall be equipped with a Telecommunications Bonding Backbone (TBB). This backbone shall be used to ground all telecommunications cable shields, equipment, racks, cabinets, raceways, and other associated hardware that has the potential to act as a current carrying conductor.
2. The TBB shall be installed independent of the building’s electrical and building ground and shall be designed in accordance with the recommendations contained in the ANSI/TIA/EIA-607 Telecommunications Bonding and Grounding Standard.
3. The main entrance facility/equipment room in each building shall be equipped with a telecommunications main grounding bus bar (TMGB).
4. The TMGB shall be connected to the building electrical entrance grounding

facility. The intent of this system is to provide a grounding system that is equal in potential to the building electrical ground system. Therefore, ground loop current potential is minimized between telecommunications equipment and the electrical system to which it is attached.

5. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, etc. shall be grounded to the respective TGB or TMGB using a minimum #6 AWG stranded copper bonding conductor and compression connectors.
6. All wires used for telecommunications grounding purposes shall be identified with a green insulation. Non-insulated wires shall be identified at each termination point with a wrap of green tape.
7. All cables and bus bars shall be identified and labeled in accordance with the System Documentation Section of this specification.
8. **Wall-Mount Busbars**
 - Attach busbars to the wall with appropriate hardware according to the manufacturer's installation instructions.
 - 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.
 - 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.
 - The wall-mount busbar shall be bonded to ground as part of the overall Telecommunications Bonding and Grounding System.
9. **Rack-Mount Busbars and Ground Bars**
 - 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.
 - Attach rack-mount busbars and ground bars to racks or cabinets according to the manufacturer's installation instructions.
 - Bond the rack-mount busbar or ground bar to the room's TMGB or TGB with appropriately sized hardware and conductor.
10. **Ground Terminal Block**
 - Every rack and cabinet shall be bonded to the TMGB or TGB.
 - 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.
 - 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.
11. **Pedestal Clamp**
 - 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.
 - 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.
 - 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.
 - Remove insulation from conductors where wires attach to the pedestal clamp.
12. Pipe Clamp
- 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.
 - 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.
 - Remove insulation from conductors where wires attach to the pipe clamp.
13. Equipment Ground Jumper Kit
- Bond equipment to a vertical rack-mount busbar or groundbar using ground jumper according to the manufacturer's recommendations.
 - 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.

F. FIRE STOP SYSTEM

1. The fire stop system is comprised of the item or items penetrating the fire rated structure, the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure.
2. Fire stop systems comprise an effective block for fire, smoke, heat, vapor and pressurized water stream.
3. All penetrations through fire-rated building structures (walls and floors) shall be sealed with an appropriate fire stop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating item i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall use the proper fire stop equipment.
4. Fire stop systems shall be UL Classified to ASTM E814 (UL 1479).

3.3 System Closeout and As-built Documentation

- A. Upon completion of the installation, the telecommunications contractor shall provide three (3) full documentation sets to the Owner's Representative/Engineer for approval. One (1) to be a hardcopy and two (2) to be electronic copies. Documentation shall include the items detailed in the sub-sections below.
- B. Documentation shall be submitted within ten (10) working days of the completion of each construction phase. This is inclusive of all test results and draft as-built drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within 30 calendar days of the completion of each testing phase. At the request of the Owner's

Representative/Engineer, the telecommunications contractor shall provide copies of the original test results.

- C. The As-Built drawings are to include conduit routes, utility vault/pull box locations, surface mount enclosure locations, PVC to GRC transition points and the approved labeling identifiers. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2008) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner.

END OF SECTION

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STRUCTURED CABLING SYSTEM

PART 1 – GENERAL

1.1 Scope of Work

- A. This document describes the requirements for the contractors, products and installation relating to furnishing and installing a Structured Cabling Plant.
- B. The Cabling System as described in this document is comprised of cabling, infrastructure and termination hardware to provide an approved TIA/EIA Data Networking and Voice Communication Structured Cabling System.
- C. Provide all labor, materials, tools and equipment required for the complete installation of work called for on the Construction Drawings and described in the Specifying Documentation.
- D. 271000 contractors shall be complete with work including all testing and labeling prior to 272000 contractor work start. Owner requires a minimum of 5 days to review test documents prior to network start up.

1.2 Contractor Qualifications/Quality Assurance

- A. Safety and Indemnity
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 “1.5 A. Safety & Indemnity”.
- B. Contractor Qualifications
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 “1.5 B. Contractor Qualification”.
- C. Quality Assurance
 - 1. Contractor shall comply with all requirements as specified in Section 270000 “1.5 Quality Assurance”.
- D. Warranty
 - 1. Contractor shall comply with all requirements as specified in Section 270000 “1.8. Acceptance & Warranties”.
 - 2. The bid package shall be accompanied by a warranty commitment binding the awarded contractor and manufacturer to a Lifetime Structured Cabling Warranty with guaranteed performance criteria set forth in this document and/or set forth by the Manufacturer. Contractor must be trained and certified in the installation of the Manufacturer system proposed. Contractor shall submit proof of current certification in the Certified Installer Program as a Premier or Authorized Network Installer in order to install and fully warrant the Cabling System. Copy of current Certificate must be included in Proposal if not already on file with Architect/Consultant/Owner.
 - 3. A Lifetime warranty (or 25yr minimum) for the structured cabling system shall be provided for an end-to-end permanent link model installation which covers the performance of the cable, connecting hardware and the labor cost for the repair or replacement of the link.

4. Links failing test parameters or producing marginal pass results will be retested or replaced at Contractor expense until link test results passing TIA/EIA Standard parameters for the category rating or better are achieved.
5. Warranty application is to be submitted in advance of the project start, and full test reports shall be delivered to Manufacturer within 15 days of project completion. Lifetime Manufacturer warranty processing is to be completed by Contractor and warranty certificate delivered to owner upon project completion.

1.3 Submittal Documentation

- A. The successful contractor shall provide their submittal package in accordance with the Section 01 20 00 1.06 Submittal Schedule, and Section 270000 "1.6 Submittal Documentation".

1.4 Equivalent Products

- A. All Products Leviton, Berk-Tek, Superior Essex, and Chatsworth form the basis of design for this Specification. Part numbers, where provided, exemplify the feature set expected to be provided for this Structured Cabling Plant.
- B. Pre-Approved Equals:
 1. None, all alternate materials must be submitted for approval prior to bid.
- C. Structured cabling manufacture system warranties shall be Limited Lifetime or 25-year.
- D. Contractors wishing to approve a system other than those specified in this document shall do so in accordance with Section 270000 "1.7 Equivalent Products".

1.5 Typical configurations

- A. All room configurations are based on the "Learning Wall" and entry door. All locations shall be installed per plan. Classrooms shall have on average 17 Cat6 cables in each room;
 1. Entry door shall have ONE Cat6 cable for IP wall phone (one voice).
 2. Four (4) Cat6 cables, with two on each side of the whiteboard (two data, two voice)
 3. Student work area shall have eight (8) Cat6 cables (8 data)
 4. Ceiling area shall have four (4) Cat6 cables (one for the A/V projector, one for the A/V switcher, and two for wireless access point). A red colored dot is to be placed on the ceiling grid to mark the location of these four cables.
 5. Depending on the orientation of the room, two additional Cat6 cables may be added to allow for teacher flexibility.
- B. Computer labs shall have 48 Cat6 cables in each room
 1. Entry door shall have ONE Cat6 cable for IP wall phone (one voice).
 2. Computer labs shall have FORTY Cat6 cables.
 3. Standard A/V classroom install is included: A/V Control Panel, two input modules, and either wall or pole mounts.
 4. Ceiling area shall have four Cat6 cables (one A/V projector, one A/V switcher,

two wireless access point). A red colored dot is to be placed on the ceiling grid to mark the location of these four cables.

5. Three Cat6 for the teacher (phone, computer, and printer).

C. All rooms shall be field verified prior to installation.

PART 2 – PRODUCTS

2.1 Work Area Subsystem

A. The Work Area shall consist of the connectivity equipment used to connect the horizontal cabling subsystem and the equipment in the work area. The connectivity equipment shall include the following options:

- Patch Cords
- Modular Inserts and Jacks
- Faceplates

1. Category 6 and Category 6A Outlet Patch Cords

- *OWNER PROVIDED*

B. Modular Inserts and Jacks

1. Category 6A Keystone Jack (for Wireless and other uses as specified)

- Jacks must meet or exceed the Category 6A standard.
- Jacks shall be 8-position 8-conductor RJ45-style and must have "retention- force technology" or equivalent feature to prevent time damage over the life of the jack regardless of use
- Jacks shall be 8 position un-keyed
- Jack shall be rear-terminated industry- standard 110 IDC. Lead-frame jacks shall not be used in this Cable Plant.
- Jacks shall have a designation indicating Category 6A on the nose which can be plainly seen from the front of the faceplate. Bottom of jack shall have date code.
- Jacks shall utilize a paired punch down sequence. Cable pair twists shall be maintained up to the IDC, terminating all conductors adjacent to its pair mate to better maintain pair characteristics designed by the cable manufacturer.
- Jacks shall terminate 22-26 AWG stranded or solid conductors.
- Jacks shall be compatible with single conductor 110 impact termination tools.
- Jacks shall have an attached color coded wiring instruction label housed between the IDC termination towers.
- Jacks shall be manufactured in the USA
- Jacks shall be compatible with TIA/EIA 606 color code, and have removable high-visibility color labels designating pair locations. Split-colored T568A/B labels are not approved.
- Jacks shall utilize pair-separation towers for ease of untwisting pairs, and shall employ a snap-on rear termination cover designed for suppression and isolate of cross-talk of neighboring connectors.
- Jacks will be terminated according to the T568B wiring scheme.
- Color:

Data Jacks will be BLUE
Voice Jacks will be WHITE
Wireless Jacks will be
YELLOW A/V Jacks will be
GRAY Camera Jacks will be
PURPLE

- Quantity: Contractor will provide and install one jack for every outlet cable shown on the drawings.
Part#:
Data Jacks will be 61110-RL6
Voice Jacks will be 61110-RW6
Wireless Jacks will be 61110-RY6
A/V Jacks will be 61110-RG6
Camera Jacks will be 61110-RP6
- 2. Category 6 Keystone Jack (for General-Purpose Data/Voice applications)
 - Jacks must exceed the Category 6 standard, and must be Component-Rated for performance.
 - Jacks shall be 8-position 8-conductor RJ45-style and must have "retention- force technology" or equivalent feature to prevent time damage over the life of the jack regardless of use
 - Jacks shall be 8 position un-keyed
 - Jack shall be rear-terminated industry- standard 110 IDC. Lead-frame jacks shall not be used in this Cable Plant.
 - Jacks shall have a designation indicating Category 6 on the nose which can be plainly seen from the front of the faceplate. Bottom of jack shall have date code.
 - Jacks shall utilize a paired punch down sequence. Cable pair twists shall be maintained up to the IDC, terminating all conductors adjacent to its pair mate to better maintain pair characteristics designed by the cable manufacturer.
 - Jacks shall terminate 22-26 AWG stranded or solid conductors.
 - Jacks shall be compatible with single conductor 110 impact termination tools.
 - Jacks shall have an attached color coded wiring instruction label housed between the IDC termination towers.
 - Jacks shall be manufactured in the USA
 - Jacks shall be compatible with TIA/EIA 606 color code, and have removable high-visibility color labels designating pair locations. Split-colored T568A/B labels are not approved.
 - Jacks shall utilize pair-separation towers for ease of untwisting pairs, and shall employ a snap-on rear termination cover designed for suppression and isolate of cross-talk of neighboring connectors.
 - Jacks will be terminated according to the T568B wiring scheme.
 - Color:
Data Jacks will be BLUE
Voice Jacks will be WHITE
Wireless Jacks will be
YELLOW A/V Jacks will be
GRAY Camera Jacks will be

PURPLE

- Quantity: Contractor will provide and install one jack for every outlet cable shown on the drawings.
Part#:
Data Jacks will be 61110-RL6
Voice Jacks will be 61110-RW6
Wireless Jacks will be 61110-
RY6 A/V Jacks will be 61110-
RG6 Camera Jacks will be
61110-RP6

C. Wall Mount and Modular Furniture Faceplates

1. Wall Plates

- Faceplates shall be UL Listed and CSA Certified
- Faceplates shall be 2.75" W x 4.5" H (69.8 mm x 114.3 mm)
- Faceplates shall provide for TIA/EIA 606 compliant station labeling.
- Faceplates shall have plastic covers over the mounting screws that can be replaced with a clear plastic window over a printable paper insert.
- Faceplates shall have an industry-standard KEYSTONE opening style, and shall accept any Keystone modular insert.
- Faceplates shall be made in the U.S.A.
- Color: Faceplate to be WHITE
- Quantity: Contractor will provide and install one single gang faceplate for each outlet shown on the drawings.
- Part#:
6 Port Face Plate, PN# 42080-
6WS 4 Port Face Plate, PN#
42080-4WS 2 Port Face Plate,
PN# 42080-2WS

2. Blank Insert

- Color: Blank Insert to match device place or raceway.
- Quantity: Contractor will provide and install one insert for every unused port in a faceplate.
- Part#: 41084-B*B

3. Blank Wall Plates

- Faceplate shall be constructed from stainless steel.
- Faceplates shall be UL Listed and CSA Certified
- Faceplates shall be 2.75" W x 4.5" H (69.8 mm x 114.3 mm) for single gang.
- Color: Faceplate to be STAINLESS STEEL
- Quantity: Contractor will provide and install one faceplate for each unused data/voice/video/intercom outlet shown on the drawings.
- Part#: 84014-40

4. Surface Mount Raceway Insert

- Inserts for Wiremold's 4050, 5450 and 5550 Device Mounting Brackets
- Insert shall allow for two category 6 jacks to be mounted flush.
 - Insert shall match the color of the Raceway installed.
 - Color: Faceplate to be IVORY
 - Quantity: Contractor will provide and install one 2-port insert for each outlet in the Surface Mount Raceway shown on the drawings.
 - Part#: Equal to Wiremold, PN# 5507-FRJ

2.2 Horizontal Distribution Cabling

The horizontal distribution cabling system is the portion of the telecommunications cabling system that extends from the Work Area (WA) telecommunications outlet/connector to the horizontal cross-connect in the Telecommunications Room (TR).

- Cabling Support System
- Copper Station Cabling
- Copper Cross-Connect Cabling

A. Copper Station Cable

1. Category 6A Unshielded Twisted Pair (UTP) Cable

- Cable will meet or exceed the proposed requirements of ANSI/TIA 568-C.2 and ISO/IEC 11801 Category 6 Cable Standard for: NEXT and ELFEXT (Pair-To-Pair and Power Sum), Insertion Loss (Attenuation), Return Loss, PSANEXT, and Delay Skew.
- Cable shall be proven to support 10 Gigabit Ethernet / 10GBASE-T, Gigabit Ethernet / IEEE 802.3an, Gigabit Ethernet / 1000BASE-T / IEEE 802.3ab, ATM up to 155 Mbps, IEEE 802.3af Power Over Ethernet for VoIP, 100 Mbps Fast Ethernet / 100BASE-T / IEEE 802.3, ANSI.X3.263 FDDI TP-PMD, Ethernet / 10BASE-T / IEEE 802.3, 4 & 16 Mbps Token Ring / IEEE 802.5, T1/E1, xDSL, ISDN, 550 MHz Broadband Video and standards under development such as ATM at 622 Mbps, 1.2 and 2.4 Gbps.
- The cable shall consist of four unshielded twisted pairs of thermoplastic insulated bare copper enclosed in a thermoplastic jacket.
- All cable shall conform to the requirements for communications circuits defined by the California Electrical Code (Article 800) and the Canadian Building Code. Cable listed to CEC Article 800-51(a) will be used for "Plenum" installations. Cable listed to CEC Article 800-51(b) shall be installed in vertical runs penetrating more than one floor.
- Cable shall have been certified with the UL 1666 Vertical Tray Flame Test.
- Cable shall be available in a Plenum, Riser and Indoor/Outdoor rated jackets.
- Contractor will use the indoor/outdoor rated cable for all locations where the cable pathway goes underground and/or run in exterior conduit.
- Cables shall be made in the U.S.A.
- The listed Category 6A cables in this specification are manufactured by Berk- Tek
- Color:
 - Data cable jacket will be BLUE
 - Data cable for Security Cameras will be PURPLE
- Quantity: See Drawing for quantity and installation details.
- Part#:
 - For Riser Application:
Berk-Tek LANmark-10G2, PN# 11084689
 - For Plenum Application:
Berk-Tek LANmark-10G2, PN# 11085339
 - For Indoor/Outdoor Application: Berk-Tek
LANmark 10G OSP

2. Category 6 Unshielded Twisted Pair (UTP) Cable
 - Cable will meet or exceed the proposed requirements of ANSI/TIA/EIA 568- C.2, 568-B.2 Addendum #1 and ISO/IEC 11801 Category 6 Cable Standard for: NEXT and ELFEXT (Pair-To-Pair and Power Sum), Insertion Loss (Attenuation), Return Loss, and Delay Skew.
 - Cable shall be proven to support Gigabit Ethernet / 1000BASE-T / IEEE 802.3ab, ATM up to 155 Mbps, IEEE 802.3af Power Over Ethernet for VoIP, 100 Mbps Fast Ethernet / 100BASE-T / IEEE 802.3, ANSI.X3.263 FDDI TP- PMD, Ethernet / 10BASE-T / IEEE 802.3, 4 & 16 Mbps Token Ring / IEEE 802.5, T1/E1, xDSL, ISDN, 550 MHz Broadband Video and standards under development such as ATM at 622 Mbps, 1.2 and 2.4 Gbps.
 - The cable shall consist of four unshielded twisted pairs of thermoplastic insulated bare copper enclosed in a thermoplastic jacket.
 - All cable shall conform to the requirements for communications circuits defined by the California Electrical Code (Article 800) and the Canadian Building Code. Cable listed to CEC Article 800-51(a) will be used for “Plenum” installations. Cable listed to CEC Article 800-51(b) shall be installed in vertical runs penetrating more than one floor.
 - Cable shall have been certified with the UL 1666 Vertical Tray Flame Test.
 - Cable shall be available in a Plenum, Riser and Indoor/Outdoor rated jackets.
 - Contractor will use the indoor/outdoor rated cable for all locations where the cable pathway goes underground and/or run in exterior conduit.
 - Cables shall be made in the U.S.A.
 - The listed Category 6 cables in this specification are manufactured by Berk- Tek
 - Color:
 - Data cable jacket will be BLUE
 - Data cable for Security Cameras will be PURPLE
 - Quantity: See Drawing for quantity and installation details.
 - Part#:
 - For Riser Application:
Superior Essex PN# 77-240-2A or Berk-Tek PN# 10136339
 - For Plenum Application:
Superior Essex PN# 77-240-2B or Berk-Tek PN# 10136226
 - For Indoor/Outdoor Application:
Mohawk CDT PN# M58772 (all cable jackets will be BLACK)

B. Horizontal Copper Cross-Connect Cabling

1. Voice Cross-Connect Cabling
 - Cable shall meet and/or exceed the UL Listed Type CMR and the ANSI/ICEA S-80-576 standard.
 - Cables shall be made in the U.S.A.
 - Core Construction
 - Conductors: Solid-copper conductors, 24 AWG.
 - Insulation: Flame retardant semi-rigid PVC.
 - Core Assembly: Cable core will be made up of 100 pair units consisting of four (4) 25 pair sub-units. Each group individually identifiable by color coded unit binders.
 - Jacket: Gray, flame retardant PVC jacket.

- Color: Voice cable jacket will be GRAY
- Quantity: See Drawing for quantity and installation details. The number of 25-pair cable between the MDF and the IDF shall be derived by multiplying the number of pairs required for the cross-connect by 1.25 to the nearest 25-pair increment.
- Part#:
- Superior Essex Cable: Berk-Tek:

25 pair = PN# 18-475-33 10032396
50 pair = PN# 18-579-33 10032471
100 pair = PN# 18-789-33 10032472

2.3 Backbone Cabling

The backbone cabling system is the portion of the telecommunications cabling system that extends from the Intermediate Distribution Frame (IDF) to the Main Distribution Frame (MDF).

- Fiber Optic Backbone Cabling
 - Copper Backbone Cabling
- A. Fiber Optic Backbone Cabling
1. Data System Backbone Cabling
 - Cable shall be UL/cUL OFNR/OFN FTA rated and be Flame Resistant in accordance with the UL 1666.
 - Cable shall an OSP.
 - Cable shall be constructed utilizing a loose tube design.
 - Cable will be fully water blocked combining overall water blocking tape and a moisture blocking gel for each individual tube.
 - Cable will maintain the following:
 - Crush Resistance (EIA-455-41) = 2000 N/cm
 - Impact Resistance (EIA-455-25) = 2000 Impacts w/1.6 N-m
 - Min Bend Radius:
Long Term - No Load = 15x Cable diameter
Short Term – Load = 20x Cable diameter
 - Operating Temp. = -40°C to +70°C
 - Storage Temp. = -40°C to +80°C
 - Cable shall be constructed of 50/125µ Laser Optimized rated glass capable of:
1 Gigabit Ethernet Link at 1000m/600m (@850nm/1300nm) 10 Gigabit Ethernet Link at 300m/300m (@850nm/1300nm)
 - ALL FIBER SHALL BE FUSION SPLICED
 - The Fiber Optic Cable in this specification is manufactured by Berk-Tek
 - Color: Fiber Optic cable jacket will be Black
 - Quantity: See Drawing for quantity and installation details.
 - NOTE: HYBRID CABLES ARE PREFERRED OVER SEPARATE RUNS OF EACH TYPE OF CABLE. PROVIDE JUSTIFICATION IF YOU ARE NOT ABLE TO USE THE HYBRID CABLE.
 - THE CABLES LISTED BELOW ARE ARMORED CABLE. CONTRACTOR IS REPOSNBILE TO VERIFY DIAMETER OF CABLES NEEDED VERSUS AVAILBLE CONDUIT PATHWAY.

ARMORED CABLE IS PREFERRED FOR ANY CABLING BETWEEN BULDINGS. IF ARMORED CABLE CANNOT BE USED, CONTRACTOR TO NOTIFY OWNER IN WRITING AT A MIMUMUM OF 30 WORKING DAYS PRIOR TO CABLE INSTALLATION.

- Field Breakout Kits: Leviton PN# 49887-12S is to be used for all cables more than 6 strands. Six strand cables will use 49887-06S. Provide two kits per buffer tube to be terminated.

6 Strand Armored Single Mode Fiber (needs two breakout kits)
Equal to Berk-Tek, PN# [OPRK006AB0403](#)

12 Strand Armored Single Mode Fiber (needs two breakout kits)
Equal to Berk-Tek, PN# [OPRK012AB0403](#)

24 Strand Armored Single Mode Fiber (needs four breakout kits)
Equal to Berk-Tek, PN# [OPRK12B024AB0403](#)

36 Strand Armored Single Mode Fiber (needs six breakout kits)
Equal to Berk-Tek, PN# [OPRK12B036AB0403](#)

48 Strand Armored Single Mode Fiber (needs eight breakout kits) Equal to Berk-Tek, PN# [OPRK12B048AB0403](#)

60 Strand Armored Single Mode Fiber (needs ten breakout kits)
Equal to Berk-Tek, PN# [OPRK12B060AB0403](#)

72 Strand Armored Single Mode Fiber (needs twelve breakout kits) Equal to Berk-Tek, PN# [OPRK12B072AB0403](#)

6 Strand Armored Multi Mode Fiber (needs two breakout kits) Equal to Berk-Tek, PN# [OPRK006EB3010/25](#)

12 Strand Armored Multi Mode Fiber (needs two breakout kits)
Equal to Berk-Tek, PN# [OPRK012EB3010/25](#)

24 Strand Armored Multi Mode Fiber (needs four breakout kits)
Equal to Berk-Tek PN#[OPRK12B024EB3010/25](#)

36 Strand Armored Multi Mode Fiber (needs six breakout kits) Equal to Berk-Tek PN#[OPRK12B036EB3010/25](#)

48 Strand Armored Multi Mode Fiber (needs eight breakout kits)
Equal to Berk-Tek PN#[OPRK12B048EB3010/25](#)

60 Strand Armored Multi Mode Fiber (needs ten breakout kits)
Equal to Berk-Tek PN#[OPRK12B060EB3010/25](#)

72 Strand Armored Multi Mode Fiber (needs twelve breakout kits) Equal to Berk-Tek PN# [OPRK12B072EB3010/25](#)

Hybrid 6 Armored Strand Multi Mode, 6 Strand Single Mode Fiber (needs 2 breakout kits)
Equal to Berk-Tek, PN# [OPRK012-006EB3010/25-006AB0403](#)

Hybrid 12 Armored Strand Multi Mode, 12 Strand Single Mode Fiber (needs 4 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B024-012EB3010/25-012AB0403](#)

Hybrid 18 Armored Strand Multi Mode, 18 Strand Single Mode Fiber (needs 6 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B036-018EB3010/25-018AB0403](#)

Hybrid 24 Armored Strand Multi Mode, 24 Strand Single Mode Fiber (needs 8 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B048-024EB3010/25-024AB0403](#)

Hybrid 36 Armored Strand Multi Mode, 36 Strand Single Mode Fiber (needs 12 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B072-036EB3010/25-036AB0403](#)

Hybrid 48 Armored Strand Multi Mode, 48 Strand Single Mode Fiber (needs 16 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B096-048EB3010/25-048AB0403](#)

Hybrid 60 Armored Strand Multi Mode, 60 Strand Single Mode Fiber (needs 20 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B120-060EB3010/25-060AB0403](#)

Hybrid 72 Armored Strand Multi Mode, 72 Strand Single Mode Fiber (needs 24 breakout kits)
Equal to Berk-Tek, PN# [OPRK12B144-072EB3010/25-072AB0403](#)

NON-ARMORED CABLE – NOTIFY OWNER WITH JUSTIFICATION AS TO WHY THE NON-ARMORED CABLE IS RECOMMEND FOR USE BY CONTRACTOR AT LEAST 30 WORKING DAYS PRIOR TO SCHEDULE INSTALLATION.

6 Strand Single Mode Fiber (needs two breakout kits) Equal to Berk-Tek, PN# [OPR006AB0403](#)

12 Strand Single Mode Fiber (needs two breakout kits) Equal to Berk-Tek, PN# [OPR012AB0403](#)

24 Strand Single Mode Fiber (needs four breakout kits) Equal to Berk-Tek, PN# [OPR12B024AB0403](#)

36 Strand Single Mode Fiber (needs six breakout kits) Equal to Berk-Tek, PN# OPR12B036AB0403

48 Strand Single Mode Fiber (needs eight breakout kits) Equal to Berk-Tek, PN# OPR12B048AB0403

60 Strand Single Mode Fiber (needs ten breakout kits) Equal to Berk-Tek, PN# OPR12B060AB0403

72 Strand Single Mode Fiber (needs twelve breakout kits) Equal to Berk-Tek, PN# OPR12B072AB0403

6 Strand Multi Mode Fiber (needs two breakout kits) Equal to Berk-Tek, PN# OPR006EB3010/25

12 Strand Multi Mode Fiber (needs two breakout kits) Equal to Berk-Tek, PN# OPR012EB3010/25

24 Strand Multi Mode Fiber (needs four breakout kits) Equal to Berk-Tek PN#OPR12B024EB3010/25

36 Strand Multi Mode Fiber (needs six breakout kits) Equal to Berk-Tek PN#OPR12B036EB3010/25

48 Strand Multi Mode Fiber (needs eight breakout kits) Equal to Berk-Tek PN#OPR12B048EB3010/25

60 Strand Multi Mode Fiber (needs ten breakout kits) Equal to Berk-Tek PN#OPR12B060EB3010/25

72 Strand Multi Mode Fiber (needs twelve breakout kits) Equal to Berk-Tek PN#OPR12B072EB3010/25

Hybrid 6 Strand Multi Mode, 6 Strand Single Mode Fiber (needs 2 breakout kits) Equal to Berk-Tek, PN# OPR012-006EB3010/25-006AB0707

Hybrid 12 Strand Multi Mode, 12 Strand Single Mode Fiber (needs 4 breakout kits) Equal to Berk-Tek, PN# OPR024-012EB3010/25-012AB0403

Hybrid 18 Strand Multi Mode, 18 Strand Single Mode Fiber (needs 6 breakout kits) Equal to Berk-Tek, PN# OPR036-018EB3010/25-018AB0403

Hybrid 24 Strand Multi Mode, 24 Strand Single Mode Fiber (needs 8 breakout kits) Equal to Berk-Tek, PN# OPR048-024EB3010/25-024AB0403

Hybrid 36 Strand Multi Mode, 36 Strand Single Mode Fiber
(needs 12 breakout kits)
Equal to Berk-Tek, PN# OPR12B072-036EB3010/25-036AB0403

Hybrid 48 Strand Multi Mode, 48 Strand Single Mode Fiber
(needs 16 breakout kits)
Equal to Berk-Tek, PN# OPR12B096-048EB3010/25-048AB0403

Hybrid 60 Strand Multi Mode, 60 Strand Single Mode Fiber
(needs 20 breakout kits)
Equal to Berk-Tek, PN# OPR12B120-060EB3010/25-060AB0403

Hybrid 72 Strand Multi Mode, 72 Strand Single Mode Fiber
(needs 24 breakout kits)
Equal to Berk-Tek, PN# OPR12B144-072EB3010/25-072AB0403

B. Copper System Backbone Cabling

1. Voice System Backbone Cabling

- Cable shall meet or exceed those specified in RUS Bulletin 1753F-208 (REA PE-89)
- Cables shall be made in the U.S.A.
- Core Construction
 - Conductors: Solid, annealed copper, 24 AWG unless otherwise noted on design documents.
 - Insulation: Dual insulation consisting of an inner layer of foamed polyolefin skin, colored coded in accordance with industry standards
 - Core Assembly: Cables of 25 pairs and less formed by assembling pairs together in a single group. Cables of more than 25 pairs formed by twisted pairs arranged in groups with each group having a color coded unit binder.
 - Filling Compound: The entire core assembly completely filled with ETPR compound, filling the interstices between the pairs and under the core tape.
 - Core Wrap: Non-hygroscopic dielectric tape applied longitudinally with an overlap.
 - Sheath Construction
 - Aluminum Shield: Corrosion protected plastic coated, corrugated 0.008" aluminum tape.
- Jacket: Black, linear low-density polyethylene.
- Color: Voice cable jacket will be BLACK
- Quantity: See Drawing for quantity and installation details. The number of 25-pair cable between the MDF and the IDF shall be derived by multiplying the number of pairs serving the individual telephone handsets by 1.25 to the nearest 25-pair increment.
- Part#: Equal to Superior Essex
 - Cable: 25 pair = PN# 09-097-02
 - 50 pair = PN# 09-100-02
 - 100 pair = PN# 09-104-02
 - 200 pair = PN# 09-108-02

2.4 Telecommunication Room

The Telecommunication Room (TR) includes those products that terminate horizontal and backbone cabling subsystems and connect them to the network equipment.

- Patch Cords
- Horizontal Cabling Termination Equipment
- Backbone Cabling Termination Equipment
- Cabinets, Racks, and Enclosures
- Cable Support System

A. Patch Cords

1. Copper Patch Cords

1.1 Category 6 and Category 6A Data/Voice TR Patch Cords

- *OWNER PROVIDED*

1.2 Data to Voice TR Patch Cords

- *OWNER PROVIDED*

2. Fiber Patch Cords

2.1 Fiber Optic TR Multimode Patch Cords

- *OWNER PROVIDED*

2.2 Fiber Optic TR Singlemode Patch Cords

- *OWNER PROVIDED*

B. Horizontal Cable Termination Equipment

1. Copper Termination Equipment

1.1 Data Category 6 and 6A Patch Panels

- Panels shall be made of black 16-gauge steel in 24 port configurations.
- Panels shall have optional rear cable support bar for strain relief. Cable support bar shall attach to the rear of the patch panel itself without the use of additional fasteners or screws.
- Panels shall have write-on blocks and port numbers are silk-screened in white.
- Panels shall provide wiring identification & color code and maintain an in-line, paired punch down sequence that does not require the splitting of conductors from individual cable pairs.
- The panel shall accept all QuickPort modules and feature white write-on front labels.
- Panels shall be ANSI/TIA/EIA-568-C.1, C.2 and ISO/IEC 11801 category 6 compliant.
- Panels shall be UL LISTED 1863 and CSA certified.
- Panels shall be made by an ISO 9002 Certified Manufacturer.
- Panels shall be made in the U.S.A.
- Color: Patch Panel shall be BLACK
- Quantity: See Drawing for quantity and installation details. The number of patch panels to be supplied shall be derived by multiplying the number of data/voice cables being terminated at the individual TR by 1.25 and providing additional panels in the nearest 24 port increment.
- Part#:

24-port Category 6 patch panel, angled recessed, 4W256-H24

INSTALLATION NOTE: When installing the 24-port patch panel, install two together and provide 1U of rack space for equipment installation then two panels, 1U of space, etc. VERIFY WITH OWNER RACK/CABINET LAYOUT PRIOR TO INSTALLATION.

1.2 Voice Termination Block (Intercom Backbone and Intercom Devices)

- Pair Capacity 50
- Blocks shall be wall mounted.
- Terminates 22 - 26 AWG (0.81 - 0.41mm) solid insulated cable or 18 - 19 AWG (1.02 - 0.91mm) solid stripped cable
- Blocks shall have stand-off legs included for all locations; S89 series stand- off bracket
- Made from High impact flame retardant thermoplastic
- Height: 254mm (10 in.), width: 86.4mm (3.4 in.), depth: 30.5mm (1.2 in.)
- Part#: Leviton or equal
Termination block, 40066-
M50 Mounting bracket,
40089-00D

C. Backbone Cable Termination Equipment

1. Connectors

1.1 Fiber Optic Connectors

- *Anaerobic & Mechanical terminations will not be accepted.*

1.2 Fusion-Fiber Pigtail Fusion Splice Module

- Integrated module adapter bulkhead for 12 or 24 fibers with self-contained splice holders
- Individual compartments provide slack storage and bend radius guides for respective backbone cable, 900µm tight buffer pigtails, and fusion spliced fibers
- 12-fiber color-coded 900µm tight buffer pigtails 1.5m length are pre-loaded in module per specific configuration
- Modular design allows for ease of maintenance of individual spliced fiber and allows for scaling up without impacting existing fibers
- Included accessory kit consists of heat shrink style splice sleeves, tie wraps, and mesh sleeve
- Installs in Leviton's Opt-X rack mount (Ultra, 1000i, and 500i) and wall mount fiber enclosures
- Zirconia ceramic ferrules and sleeves used
- 12-fiber splice module configurations will utilize duplex LC adapters
- 24-fiber splice module configurations will utilize quad LC adapters
- ALL FIBER SHALL BE FUSION SPLICED
- Quantity: See Drawing for quantity and installation details.
- Part #: Leviton or equal
- 12-strand Singlemode, SPLCS-12L
- 24-strand Singlemode, SPLCS-24L
- 12-strand Singlemode Fusion Splice pigtail kit, UPPLC-KIT

2. Fiber Termination Panels

2.1 IDF Rack Mount Fiber Panel

- Fiber panels shall be constructed of durable polycarbonate plastic and

- black powder-coated 16-gauge steel
- Panel shall have a sliding tray which removes completely from enclosure to facilitate field terminations and splicing
- Sliding tray with front and rear stop shall glide forward and backward providing accessibility to front and rear of bulkhead after installation
- Panel shall have a 17" depth for high-density fiber termination and/or splicing
- Front saddles shall pivot for improved patch cord routing and organization
- Removable transparent hinged doors and slide-away covers shall allow for easy access during install and visibility of interior after install
- Panel shall employ patch cord bend radius guides to minimize macro bending
- Stackable and adjustable fiber rings simplify cable management
- Panel shall be no more than 1 rack unit in height and shall hold up to 3 adapter plates.
- Panel shall be Made in the U.S.A
- ALL FIBER SHALL BE FUSION SPLICED
- COLOR: black with translucent blue cover panels
- Quantity: See Drawing for quantity and installation details.
- Part#: Leviton Opt-X SDZ 2000i no exceptions
1U - 5R1UH-S03

2.2 IDF Wall Mount Fiber Enlosure

- Panels shall be constructed of cold rolled 16 gauge steel with a black powder paint finish and provide for fully enclosed fiber termination.
- Panel shall have a door design. One door shall be lockable for the "technician side" that secures the incoming and outgoing fiber cables. The second door shall accessible to provide fiber patching as needed.
- Panels shall accept four adapter panels for 24 port configurations.
- Panels shall have a splice tray mounting stud incorporated into the base for mounting of mechanical or fusion splice trays. Panel shall have cable management anchor points and come with cable anchors allowing for the maintenance of the incoming cable with the proper minimum bend radius.
- Panels shall have cable entrance ports on the top and bottom with removable plastic dust covers.
- ALL FIBER SHALL BE FUSION SPLICED
- Color: Fiber Panel will be BLACK
- Quantity: See Drawing for quantity and installation details.
- Part: 5W320-00N

2.3 MDF Rack Mount Fiber Panel

- Fiber panels shall be constructed of durable polycarbonate plastic and black powder-coated 16-gauge steel
- Panel shall have a sliding tray which removes completely from enclosure to facilitate field terminations and splicing
- Sliding tray with front and rear stop shall glide forward and backward providing accessibility to front and rear of bulkhead after installation
- Panel shall have a 17" depth for high-density fiber termination and/or splicing

- Front saddles shall pivot for improved patch cord routing and organization
- Removable transparent hinged doors and slide-away covers shall allow for easy access during install and visibility of interior after install
- Panel shall employ patch cord bend radius guides to minimize macro bending
- Stackable and adjustable fiber rings simplify cable management
- Panel shall be 2 or 4 rack units in height and shall hold up to 6 or 12 adapter plates, respectively
- Panel shall be Made in the United States
- ALL FIBER SHALL BE FUSION SPLICED
- COLOR: black with translucent blue cover panels
- Quantity: See Drawing for quantity and installation details.
- Part#: Leviton Opt-X SDX 2000i no exceptions
2U - 5R2UH-S06
4U - 5R4UH-S12

2.4 Premise Splice Enclosures – Portable Classroom Distribution

- Modular wall-mount enclosures used to directly splice outside plant or intra- building cables
- Four fusion/mechanical splice trays; 4" Standard Splice Tray, 4" x 11.75" x 0.25" # T4LHS-P06
- Constructed of cold-rolled steel
- ALL FIBER SHALL BE FUSION SPLICED
- CPS-24, Customer Premise Splice Enclosure, empty (2 tray capacity)
- Part#: CPS24-STD

2.5 Fiber Optic Adapter Plates

- The Fiber adapter plate shall precision molded and compatible with all approved panels and enclosures (rack- or wall-mount).
- The adapter plate shall be offered in LC style in 12 or 24 fiber configurations per plate.
- The adapter plate shall be compliant to TIA-568-C.3 (for performance) and respective TIA-604-X (for intermateability) standards.
- Adapter plates shall use zirconia ceramic sleeves and be offered in standard fiber type colors pursuant to TIA-568-C.3 standards.
- The adapter and plate shall be integrated using precision-molded injection manufacturing methods, to eliminate “rattle” and loose fit.
- Adapter plates shall be made in the United States of America.
- Meets TIA-604-10B (LC) for connector intermateability
- ALL FIBER SHALL BE FUSION SPLICED
- COLOR: Aqua for Multimode, Blue for Singlemode, Black for blank plates
- Part #:
6-port Duplex LC MM Adapter Panel, 5F100-2QL
6-port Duplex LC SM Adapter Panel,
5F100-2LL Blank Adapter Panel, 5F100-PLT

2.6 Fiber Optic OSP Splice Enclosures

- Used to directly splice outside plant or intra-building cables.
- Accommodates various splice tray designs, Maximum Capacity: 96 single fibers using 5" x 7" and 4" x 7" trays
- Enclosure made from 16-gauge steel, Hinges shall be Stainless steel

- Two-year limited product warranty.
- Durable powder-coat finish COLOR: Beige
- Size 16" x 15" x 3.4"
- ALL FIBER SHALL BE FUSION SPLICED
- Part #: Leviton CPS Customer Premise Splice Enclosure, Single Door, 24 Fiber Trays # CPS24-STD
Injection Molded Mini Splice Tray, Heat Shrink style (accepts standard sleeves), up to 12 fiber splicing # T5PLS-12F
Splice Tray Mounting Hardware Kit # SPLMT-HKT
Splice Sleeve, 40 mm # FSSSD-040
Cable clamp kit # CPCSR-001 & CPCSR-002
Grounding kit # CPGRD-KIT
Key Locking kit # CPLOK-KIT

3. Copper Termination Panels

3.1 OSP Protection Panels (Intercom Backbone Headend)

- 16 AWG Powder Coated Steel Construction
- Equipped with an Internal 26 AWG Fuse Link
- External Ground Connectors Accept 6 - 14 AWG Wire
- Industry Standard 5 Pin Design
- Exceeds UL497 Primary Protection Standards
- Stackable with Connection Grommets Included
- 66 Block Accepts 22 - 26 AWG Wire/18 - 19 AWG Stripped Solid Copper Wire
- Color: NA
- Quantity: See Drawing for quantity and installation details.
Part#: Circa Enterprise inc.
25 pair block, PN# 1890ECT1-25
50 pair block, PN# 1890ECT1-50
100 pair block, PN# 1890ECT1-100

3.2 OSP Protection Fuses

- 240VDC (RUS Approved)
- Nanosecond response time
- External failsafe mechanism that permanently carbon arrestors grounds the module under sustained high current conditions
- Integrated Test Points
- UL & cUL listed
- Designed to meet or exceed Telcordia standards
- ISO 9002 Certified Manufacturer
- Color: RED
- Quantity: See Drawing for quantity and installation details.
Part#: Circa Enterprise inc. 4B1SF-240
**Provide 100% fuse density for all installed Protection Panels.*

3.3 Voice Termination Block (Intercom Backbone building/TC and Intercom Devices)

- Pair Capacity 50
- Blocks shall be wall mounted.

- Terminates 22 - 26 AWG (0.81 - 0.41mm) solid insulated cable or 18 - 19 AWG (1.02 - 0.91mm) solid stripped cable
- Blocks shall have stand-off legs included for all locations; S89 series stand-off bracket
- Made from High impact flame retardant thermoplastic
- Height: 254mm (10 in.), width: 86.4mm (3.4 in.), depth: 30.5mm (1.2 in.)
- Part#:
Leviton 66-Style Termination block, 40066-M50 Leviton 66-Style Mounting bracket, 40089-00D

D. Cabinets and Enclosures

Contractor will provide the following 'HC' Enclosures and components based on the number of cables to that will be terminated:

1. Cabinets:

- Wall-mounted cabinets shall be manufactured from steel sheet.
- Each cabinet will have a rear panel that attaches to the wall, a hinged cabinet body that swings open from the rear panel providing easy access to the rear of equipment and a locking front door.
- The rear panel will provide cable access with pre-punched knockouts, up to 3", for conduit along the top and bottom edges of the panel. There will also be cutouts in the back of the rear panel so that cables can enter the panel through the wall. The rear panel will provide attachment points for accessory equipment mounting brackets and cable tie points within the panel (cabinet).
- The cabinet body will include a single pair of vertical 19" EIA equipment mounting rails. The mounting rails will be EIA-310-D compliant with the Universal hole pattern. Mounting holes will have #12-24 threads.
- Mounting rails will be adjustable in depth so that they can be positioned at any point within the cabinet body. The design of all cabinets will allow an additional pair of mounting rails (for a total of two pairs of mounting rails per cabinet) to be added to the cabinet.
- The wall-mount cabinet shall provide a hinge design that attaches the cabinet body and the rear panel and allow the rear panel to be removed during installation. The hinge design will allow the cabinet body to open at least 90°. The hasp used to secure the rear panel and the cabinet body together will assist in drawing the components together during the locking action.
- The cabinet body will include vents that are designed to accept fan kits.
- The front door will be hinged and locking. The front door and rear panel will be keyed alike. The front door will have rounded edges and corners. The cabinet body will allow the front door to be attached so that it will swing open from the right or left. The cabinet manufacture shall provide an option for a solid or a tinted plexi-glass window front door. The plexi-glass in doors shall be bronze acrylic (not clear) with a UL flammability classification of 94HB or better.
- Finish shall be epoxy-polyester hybrid powder coat (paint).
- The cabinet shall have the option of being delivered fully assembled.

All cabinets will include installation hardware (hex lag screws) for wood studs and 50 each #12-24 equipment mounting screws.

- Load bearing capacity for cabinets that wall-mount will be a minimum of 200 pounds per cabinet.
- Cabinets that are wall-mount only will be certified and UL Listed to standard UL 60950 under category NWIN.
- CONTRACTOR TO INSTALL PROFESSIONALLY SO OWNER PROVIDED EQUIPMENT FITS IN THE RACK. VERIFY RAILS ARE PROPERLY ALIGNED SO ALL EQUIPMENT FITS (including UPS, Network equipment, cables, cords, power strip, etc.) AND DOORS CLOSE. VERIFY SPACING BETWEEN PANELS IS ADEQUATE FOR EQUIPMENT INSTALLATION. VERIFY WITH OWNER CABINET LAYOUT FOR PATCH PANELS, ETC BEFORE INSTALLATION.
- Color: Wall Mount Cabinet will be BLACK
- Quantity: See Drawing for size, quantity and installation details.
- Part#:

Wall Mount Cabinet

18U Cabinet equal to Chatsworth Products, PN# 11900-736
26U Cabinet equal to Chatsworth Products, PN# 11900-748

**Contractor will provide an additional set of mounting rails for each wall mount cabinet, equal to Chatsworth Products PN# 12787-5xx.*

Wall/Floor Mount Cabinet

33U Cabinet equal to Chatsworth Products, PN# 13495-760
40U Cabinet equal to Chatsworth Products, PN# 13495-772

**Contractor will provide an additional set of mounting rails for each wall mount cabinet, equal to Chatsworth Products PN# 13276-7xx.*

Fan Kit/Filter Kit

Equal to Chatsworth Products Fan Kit, PN# 12804-701
Equal to Chatsworth Products Filter Kit, PN# 12805-701

Grounding Kit

Equal to Chatsworth Products, PN# 10610-019
Power Strip with Surge Suppression
Leviton 5500-192

2. Floor Mount Cabinets

- Four-post frame with threaded mounting holes used to support 19" wide rack-mount communications equipment and shelves
- For indoor use only, in environmentally controlled areas; may not be used outdoors, in industrial or harsh environments, or in plenum spaces
- Includes: (1) top pan, (1) bottom pan, (4) mounting channels, (2) base angles, (2) top angles
- Assembly hardware; (100) #12-24 equipment mounting screws
- Equipment Support: Front and rear pairs of 3" deep C-shaped equipment mounting channels, Fixed in place, 29" apart front-to-rear, 19" wide, EIA-310-D compliant hole pattern
- 1-3/4" high rack-mount units (RMU); RMU spaces are marked and numbered on the channels
- Universal hole pattern, 5/8"-5/8"-1/2" vertical hole spacing

- Threaded #12-24 equipment mounting holes, Includes 100 each #12-24 equipment mounting screws
- Load capacity: 2000 lb of equipment
- Material: Aluminum extrusion, Aluminum sheet
- Construction: Bolted assembly, Ships unassembled
- VERIFY WITH OWNER CABINET LAYOUT PRIOR TO INSTALLATION.
- Color: BLACK
- Quantity: See Drawing for quantity and installation details.
- Part#: Chatsworth Products Inc.
Floor Mount Cabinet
CPI# M1050-741
Grounding
Kit 10610-019
Power Strip with Surge Suppression
Leviton 5500-192

3. Outdoor Wireless Access Point Enclosure
 - Non-glass-filled polyester material, UV resistance; Overlapping tongue-and-groove raised cover and gasket provide secure Type 4X seal
 - Removable snap-hinge cover allows for easy access to cover and body for modifications
 - Molded layout grid on inside of body and solid covers assists with component mounting
 - Molded-in embosses for rear panel mounting
 - Internal rail system and adjustable panel blocks allow
 - UL 508A Listed, NEMA/EEMAC Type 4
 - Material: Non-glass-filled polyester
 - Color: Light-Gray
 - Quantity: See Drawing for quantity and installation details.
 - Part#: Pentair
 - Polypro Wifi, PN# D16148WF

E. Cable Support System

1. Ladder Rack Cable Runway
 - Stringers shall be fabricated from 16ga .375" x 1.5" Cold Rolled Steel tubing.
 - Rungs shall be fabricated from 16ga .5" x 1.0" Cold Rolled Steel tubing
 - Rungs shall be spaced at 9.0" center to center
 - A straight length of ladder shall be capable of supporting 45 pounds per foot when a 10' length is tested according to NEMA VE-1.
 - Ladder Rack shall have a powder coat finished.
 - Ladder Rack shall be available in standard 6ft. and 10ft. lengths.
 - Ladder rack shall be a part of a total system that includes: manufacture bends, wall supports, joining hardware, etc.
 - Ladder Rack shall be grounding per the TIA/EIA 607-A.
 - Color: Ladder Rack will be BLACK
 - Quantity: See Drawing for quantity and installation details.

- Part#: Equal to Chatsworth Products Cable Raceway, PN# 11252-71X

PART 3 – BACKBONE SLACK LOOPS

- Storage rings may be used to store coiled slack loops on backboard.
- Part #:
Fiber storage rings, Indoor fiber: 48900-IFR Fiber storage rings,
Outdoor fiber: 48900-OFR

PART 4 – EXECUTION

4.1 Installation

A. Work Area Outlets Installation

- No more than 12” of cable shall be stored in an outlet box, modular furniture raceway, or insulated walls.
- Bend radius of the cable in the termination area shall not be less than 4 times the outside diameter of the cable.
- The cable jacket shall be maintained to within 12.7mm (½ inch) of the termination point.
- All UTP cables shall have no more than 6.4mm (1/4 inch) of pair *untwisted* at the termination point.
- Data jacks, unless otherwise noted in drawings, shall be located in the top position(s) of each faceplate. Data jacks in horizontally oriented faceplates shall occupy the left-most position(s).
- Voice jacks, unless otherwise noted in drawings, shall occupy the next position(s) below the data on the faceplate. Voice jacks in horizontally oriented faceplates shall occupy the position left of the data jack.
- Video jacks, unless otherwise noted in drawings, shall occupy the bottom position(s) on the faceplate. Video jacks in horizontally oriented faceplates shall occupy the position left of the data/voice jack.
- All faceplates installed shall be level.
- All outlets will be labeled according to the approved labeling scheme.
- Each faceplate shall be machine labeled. The labeling shall be placed on the faceplate so that the individual jack can be clearly identified by its associated label.
- Cables shall be identified by a self-adhesive label in accordance with the Identification and Labeling section of this specification and ANSI/TIA/EIA-606. The cable label shall be applied to the cable no further than 6” behind termination module, behind the faceplate on a section of cable that can be accessed by removing the cover plate.

B. Horizontal Distribution Cable Installation

- Cable shall be installed in accordance with manufacturer’s recommendations and best industry practices.
- Nylon or plastic locking cable ties, e.g. "Zip-Ties", shall not be used on this

project.

- Contractor will provide at least a three foot “service loop” for all station cables. The service loop will be coiled and secured using Velcro in the accessible ceiling at the conduit stub to the work area outlet box.
- Tie Wraps will not be allowed for supporting, bundling and/or dressing of any station cables on this project.
- Contractor will provide at least a three foot “service loop” for all station cables. The service loop will be coiled and secured using Velcro in the accessible ceiling at the conduit stub to the work area outlet box.
- A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in all “common” conduit runs. “Common” Conduit Runs are those that house more than one cable or set of cables that do not specifically feed a Work Station Outlet. Examples of “Common” Conduit Runs are: floor/ceiling penetrations, stub-throughs, distribution conduits, all conduits between J- boxes, etc.
- Cable raceways shall not be filled greater than the Owner’s 40% fill ratio. Contact Owner as needed to understand the Owner’s fill ratio requirement.
- Cables shall be installed in continuous lengths from origin to destination (no splices) except for transition points, or consolidation points.
- The cable’s minimum bend radius and maximum pulling tension shall not be exceeded.
- Pulling tension on 4-pair UTP cables shall not exceed 25-lb for a four-pair UTP cable.
- The Cable Support System shall be installed in such a way that will allow for future cables to be added and to provide sufficient protection of all cable.
- For all installs where station cables are not installed in a continuous conduit run the following guidelines will apply. The Contractor will be responsible to reinstall all cables and pathways that do not meet with the following at no additional cost to the Owner:
 - J-hooks shall be installed to support all station cables every 14” – 28” inches.
 - All pathways shall be run at right angles. No diagonal pathways will be allowed unless otherwise noted on the drawings.
 - Horizontal cables shall be bundled in groups of no more than 25 cables per Caddy’s CAT21 J-hook, no more than 40 cables per Caddy’s CAT32 J-hook, and no more than 64 cables per Caddy’s CAT64 J-hook.
 - A separate J-hook is used for each group of cable. Specifically, CAT6 cable, fiber cable, and fire alarm are to have their own J-hook.
 - At no point shall cable(s) rest on acoustic ceiling grids, acoustic panels, or lighting fixtures.
 - All cables will be installed so that there is a minimum of 3” of clearance above all ceiling grid and tiles.
 - All cables will be installed so that there is a minimum of 12” of clearance above all florescent lighting.
 - All cables will be installed so that there is a minimum of 6” of clearance from all fire alarm and electrical system conduits.
 - Cables shall not be attached to the ceiling grid or lighting fixture wires. The contractor will provide their own carriers wires to support their horizontal cabling.

- All cables shall be installed above fire-sprinkler systems and plumbing system fixtures and devices. Cables shall not be attached to or supported by these fixtures and/or their 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.
- Contractor is responsible for sealing around all cables that penetrate fire rated barriers.
- Wireless and overhead cables shall be secured by an in-ceiling mounting bracket affixed to its dedicated ceiling wire or mounted to building structure.
- Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.

C. Horizontal Cross-Connect Installation

- Cables shall be cleaned, dressed, and terminated in accordance with the recommendations made in the TIA/EIA-568-A standard, manufacturer's recommendations and best industry practices. Contractor to verify standard network equipment can be installed without any interference from the cables. Equipment typically is installed directly above and/or below the panel.
- The cable jacket shall be maintained to within 12.7mm (½ inch) of the termination point.
- All UTP cables shall have no more than 6.4mm (¼ inch) of pair *untwist* at the termination point.
- Bend radius of the cable in the termination area shall not exceed 4 times the outside diameter of the cable.
- All cables shall be neatly bundled in groups of 24 and dressed continuously from the entrance point of the Telecommunications Room to their respective panels or blocks. Each panel or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame. Contractor will use Velcro strip to bundle cables together. The use of Tie –Wraps is not permitted.
- Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that can be viewed without removing the bundle support ties. Cables labeled within the bundle, where the label is obscured from view shall not be acceptable.

D. Backbone Cable Installation

- Backbone cables shall be installed separately from horizontal distribution cables.
- Each individual cable is to be labeled. See details sheets for labeling examples. Cable type, installation date, and from/to are required. Each cable to be labeled at any accessible point, including, but not limited to, pull boxes, Christy boxes, junction boxes, and any pass through location.
- Where possible the backbone and horizontal cables shall be installed in separate conduits.

- Where possible backbone cables of the same type shall be combined in conduit runs to maximize conduit fill ratios.
- Where backbone cables and distribution cables are installed in a cable tray or wireway, backbone cables shall be installed first and bundled separately from the horizontal distribution cables.
- Pulling tension on Backbone cables shall not exceed the manufacture's limitations.
- The minimum bend radius for all Backbone cables is 16 times the cable diameter or the manufactures specification, whichever is greater.
- Cable slack shall be provided in every pull box, junction box, cabinet, entry facility, telecom room and termination enclosure.
 - * 25 feet of slack per cable shall be mounted on a service ring inside the enclosure.
 - * All cable shall be installed such that all cable is above the bottom of the enclosure. All cable shall be suspended on cable support hooks around the perimeter of the enclosure. Cable Support Hooks equal to Hubbell Power Systems PN# C2031124 and C2031133 (part numbers dependent on size of enclosure, sample part numbers only, not to be used in all circumstances).
 - * Entry & telecom rooms & cabinets: Minimum 25' feet coiled in re-closeable storage ring.
 - * If 25' is not possible, contact the owner and discuss an agreeable amount of slack, followed up with an confirming RFI.
 - * Minimum of 25' of slack in each vault and a minimum of 15' of slack in any other type of box (pull box, Christy box, pass through space, etc).
- All OSP cables may not penetrate more than 50ft into the buildings before be terminated or splices to cable with a fire resistant jacket, unless the jacket is indoor/outdoor rated.
- A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in any conduit.
- All backbone cables shall be securely fastened to the sidewall of the TR on each floor.
- Backbone cables spanning more than three floors shall be securely attached at the top of the cable run with a wire mesh grip and on alternating floors or as required by local codes.
- Vertical runs of cable shall be supported to messenger strand, cable ladder, or other method to provide proper support for the weight of the cable.
- Large bundles of cables and/or heavy cables shall be attached using metal clamps and/or metal banding to support the cables.

E. Backbone Cross-Connect Installation

- Cables shall be cleaned, dressed, and terminated in accordance with the recommendations made in the TIA/EIA-568-C document, manufacturer's recommendations and best industry practices.
- Bend radius of the cable in the termination area shall not exceed 16 times the outside diameter of the cable.
- All cables shall be neatly bundled and dressed continuously from the entrance point of the Telecommunications Room to their respective panels or blocks.

- Contractor will provide a minimum of a 3 foot “service loop” for each backbone cable before terminating to allow future rearrangement. Cables will be coiled and secured above the ceiling where possible or to the Telco Backboard where entrance point is from the floor.
- Wall mounted termination block fields shall be installed with the lowest edge of the mounting frame 18” from the finished floor.
- Contractor shall provide a machine label 1ft. to 2ft. from the entrance point of the TR and 6in. to 12in. from the termination point on each backbone cable. Cable shall be easily identified and fully legible without removing the bundle support ties.

F. Cabinets, Racks, Enclosures and Ladder Rack Installation

- Wall Mount Racks/Cabinets shall be securely attached to the Telco Backboard using minimum 5/16” hardware or as required by local codes. Mounting rails shall be adjusted to the proper depth to allow for the closing of doors when populated with network electronics. Coordinate with Owner for final depth required.
- Floor Mount Racks/Cabinets shall be securely attached to the concrete floor using minimum 3/8” drop-in anchor hardware or as required by local codes.
- All Floor Mount Racks/Cabinets will be either; secured on one side to the wall or attached to the closest wall with ladder rack.
- All Racks/Cabinets shall be braced to meet Zone 4 seismic requirements.
- Contractor will maintain a minimum of 36 inches of clearance from the front of the all rack/cabinets and all other obstructions.
- Floor Mount Racks/Cabinets shall be installed to allow for a minimum of 36” from rear and all other obstructions.
- All racks shall be grounded to the telecommunications ground bus bar.
- Rack mount screws not used for installing patch panels and other hardware shall be bagged and left with the rack upon completion of the installation.
- The plywood bottom edge shall be mounted vertically no less than 12” above the finished floor.
- Contractor will provide all cutouts for the Electrical Contractors expansion rings and electric receptacles as shown on the drawings.
- Ladder Rack must be securely attached to walls, backboards, and racks/cabinets to comply with all Zone 4 seismic requirements.
- Ladder rack shall be installed so that there is a minimum of 8” of unobstructed clearance above rack.
- Ladder Rack shall be installed so that there is a minimum of 12” of clearance from all: florescent lighting, electrical conduits/circuits, and fire alarm conduits/devices.

4.2 Identification and Labeling

- A. The labeling scheme for CAT6 cable is as follows for classrooms (verify with Owner prior to printing the labels):

When entering the room (if the room has multiple doors, the door designated as the primary entry door), label numbering shall start a one (1) and then increment as data drops are added going around the room, then any drops in the ceiling, and then any drops

in the floor. For each room, numbering starts over at one (1). Each jack color starts at one (1) and increments for each additional jack of the same color. Label designations are based on jack color:

Blue = D# White = V# Yellow = W# Gray = A# Purple = C#

Patch Panel Label Format: RM# - _____

The first part of the label shall be the room number the data drop is located in, RM is part of the label, followed by the room number or room designation. The last part of the label shall be the type, as stated above based on jack color, then followed by the drop number. For example, RM3-D10 is room 3, data drop 10. RM3-V2 would be room 3, voice data drop 2.

The label format in the room: RM# - -

The first part of the label shall be RM, followed by the room number/ designation the cabinet/rack is located in.

The second part of the label shall be the patch panel the cable is terminated on. The top most panel is A and continues down with B, C, etc... If multiple panels span more than one rack/cabinet, when standing in front of the rack/cabinets, the top left panel shall be A.

The last part of the label uses the label based on jack color, as stated above, and the drop number. Example, RM3-A-D10: Indicates the other end of the cable is in the cabinet/rack in room 3, terminated on panel A, and the last portion, ie D10 in this example, was the tenth data drop in this room. The last portion, D10 in this example, would match the patch panel label, RM3-D10.

Label scheme for non-classroom buildings follows the above scheme, but the label number starts at 1 (one) for each type (D, V, W, A, C) and increments throughout the building and does not reset for each room/office. Start at one and do not repeat the number anywhere in the building (for each type).

- B. The approved system will comply with the TIA/EIA -606-A Class 2 designations and include at a minimum, identifiers for all major components of the system: telecommunication rooms, grounding bus bars, racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labeled to identify the location within the cable system infrastructure.
- C. All label printing will be machine generated or hand-held printers using indelible ink ribbons or cartridges. Self-laminating labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end. Outlet, patch panel and wiring block labels shall be installed on, or in, the space provided on the device.
- D. All labeling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labeling scheme.

- E. All fiber cable labels are to include the type, count, from and to on each label. Any point the fiber is accessible shall be labeled. At a minimum, that would include the starting point, any Christy boxes, cabinets/racks, any rooms the cable passes through, and the ending point. Service loops provided and labeled at each location, a minimum of 25' in each vault and 15' minimum in a Christy box/any other box or pass through space.
- F. Labels are to be verified by Owner prior to printing. Labels are to include building/room designations used by the site. Do NOT use building/room designations from the plans unless approved by Owner in writing.
- G. Fiber optic cable lables are to verified by Owner prior to printing and include:

CABLE TYPE
FROM TO
DATE INSTALLED

For example:
Single Mode – 36 Count
MDF IDF in Room XX
INSTALLED: JULY 2017

4.3 Testing and Acceptance

A. General

1. The Owner reserves the right to be present during any & all types of tests being performed.
2. Contractor will notify the Owner/Owner's Representative 24 hours before commencement of testing.
3. Upon receipt of the test documentation, the Customer reserves the right to have the contractor perform a 10% witnessed "spot testing" of the cabling system to validate test results provided in the test document, at no additional cost. If a significant amount of cables are marginal and/or fail during the "spot test" Contractor will retest the entire cable plant at no additional cost.
4. Contractors shall provide proof of test equipment calibration prior to testing.
5. Test equipment shall have been factory calibrated within six months of project testing dates.
6. All cables and termination hardware shall be 100% tested for defects in installation and to verify cabling system performance under installed conditions according to the requirements of TIA/EIA-568-C, TSB-67 and TSB-95. All pairs of each installed cable shall be verified prior to system acceptance. Any defect in the cabling system installation including but not limited to cable, connectors, feed through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.
7. All cables shall be tested in accordance with this document, the ANSI/TIA/EIA standards, the Manufacturer's Warranty guidelines and best industry practice. If

any of these are in conflict, the Contractor shall bring any discrepancies to the attention of the project team for clarification and resolution.

8. Test results are required to be sent to Owner in PDF format and in FLW format. IF there are an unusual amount of cables that passed marginal, as indicated by the tester, Contractor to re-terminate all cables and re-test.

B. Copper Cable Testing

1. Twisted Pair Cable

- All twisted-pair copper cable links (including backbone cables) shall be tested for continuity, pair reversals, shorts, opens and performance as indicated below.
- Continuity - Each pair of each installed cable shall be tested using a test unit that shows opens, shorts, polarity and pair-reversals, crossed pairs and split pairs. Shielded/screened cables shall be tested with a device that verifies shield continuity in addition to the above stated tests. The test shall be recorded as pass/fail as indicated by the test unit in accordance with the manufacturers' recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and the cable re-tested prior to final acceptance.
- Cables that are passed by the tester but marked as marginally passed, typically indicated by an asterisk (*), may be required to be re-terminated and re-tested by Owner if there are an unusually high percentage of cables that were marginally passed by the tester. Unusually high is determined by Owner.
- Length - Each installed cable link shall be tested for installed length using a TDR type device. The cables shall be tested from patch panel to patch panel, block to block, patch panel to outlet or block to outlet as appropriate. The cable length shall conform to the maximum distances set forth in the ANSI/TIA/EIA-568-A Standard. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number. For multi-pair cables, the shortest pair length shall be recorded as the length for the cable.

2. Category 6 Performance

- Follow the Standards requirements established in:
 - ANSI/TIA/EIA-568-C.0
Wire Map Length Attenuation
NEXT (Near end crosstalk)
 - ANSI/TIA/EIA-568-C.2 Return Loss
ELFEXT Loss Propagation Delay Delay skew
PSNEXT (Power sum near-end crosstalk loss) PSELFEXT (Power sum equal level far-end crosstalk loss)
- A Level III or better test unit is required to verify category 6 performances and must be updated to include the requirements of TSB-95 and Amendment 5. Testers will be equal to or better than Fluke Network's Versiv DSX CableAnalyzer.
- All testers shall have been recalibrated within 6 months of use on this project. Contractor will be asked to provide proof of recalibration.

- Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the TIA/EIA Standard, and the result shown as pass/fail. The approved Level Three tester shall provide a printed document for each test that is also available in a downloadable file using an application from the test equipment manufacturer. The printed test results shall include a print out of all tests performed, and the individual test results for each cable. A PDF of the test results and the Fluke FLW File are required to be sent to Owner for review.

3. Category 6A Performance

- Shall meet all test parameters as stated above for Category 6, with the addition of PSANEXT, PSAACR, and PSAACR-F:

C. Fiber Optic Cable Testing

1. Backbone Fiber

- Each fiber strand 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. Cable length shall be verified using sheath markings. The guidelines and procedures established for Tier 1 testing in TIA/TSB-140 shall apply.
- All fiber optic cables shall be tested from the site's MDF to each fiber terminals located in the IDF. The results of OTDR testing to define the length of each riser cable shall be documented. The Contractor shall conduct a power meter (loss) test of each fiber optic station and riser cable at both wavelengths, 850/1300nm for MM and 1310/1550nm for SM, A to B, B to A, and OSPL (OSPL is defined as $L_a + L_b$). No individual station or riser fiber link segment (including connectors) shall measure more than 2.0 dB loss. Tests shall be conducted using ANSI/EIA/TIA/EIA-526-14A, Method B. Test results evaluation for the panel to panel (backbone) shall be based on the values set forth in ANSI/TIA/EIA-568-C.2. The Contractor shall provide an electronic printout for each strand tested with the Power Meter and the OTDR.
- 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.
- All installed cables must meet or exceed the defined standards for performance. The Contractor shall take all steps necessary to repair or replace any optic not meeting the standard.
- Fiber optic riser and station cable test results shall be provided in electronic format to the Owner. PDF and Fluke FLV files are to be sent to Owner.

4.4 System Closeout and As-built Documentation

- A. Upon completion of the installation, the telecommunications contractor shall provide three (3) full documentation sets to the Owner's Representative/Engineer for approval. One (1) to be a hardcopy and two (2) to be electronic copies. Documentation shall include the items detailed in the sub-sections below.
- B. Documentation shall be submitted within ten (10) working days of the completion of each testing phase. This is inclusive of all test results and draft as-built drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within 30 calendar days of the completion of each testing phase. At the request of the Owner's Representative/Engineer, the telecommunications contractor shall provide copies of the original test results.
- C. The Owner's Representative/Engineer will request that a 10% random field re-test be conducted on the cable system, at no additional cost, to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the telecommunications contractor, additional testing can be requested to the extent determined necessary by the Engineer, including a 100% re-test. This re-test shall be at no additional cost to the Owner.
- D. Test Results documentation shall be provided in two media, as listed above, one (1) hardcopy and one (1) on USB within three weeks after the completion of the project. The documentation shall be clearly marked on the outside front cover with the words "Project Test Documentation", the project name, and the date of completion (month and year). The results shall include a record of test frequencies, cable type, conductor pair and cable (or outlet) I.D., measurement direction, reference setup, and crew member name(s). The test equipment name, manufacturer, model number, serial number, software version and last calibration date will also be provided at the end of the document. Unless the manufacturer specifies a more frequent calibration cycle, a bi-annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test as well as the software version being used in the field test equipment.
- E. Printouts generated for each cable by the wire test instrument shall be submitted as part of the documentation package.
- F. When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be documented.
- G. The As-Built drawings are to include cable routes, outlet locations and the approved labeling identifiers. Their sequential number as defined elsewhere in this document shall identify outlet locations. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner.
- H. Contractor will provide one laminated 11"x17" drawing at each IDF that includes the building layout for that IDF, along with the outlet locations and all of the approved

labeling. The as-built/current layout is to be provided.

- I. Test results are to be submitted to the manufacturer and a copy of the warranty certification is to be provided to the owner.

END OF SECTION

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MULTI-PURPOSE SOUND SYSTEM

PART 1 – GENERAL

1.1 Scope of Work

- A. The intent of these Specifications is to provide a complete multi-use sound System and it is the responsibility of the bidding Contractor to provide a complete solution. It is also the responsibility of the Contractor to provide all material necessary to provide a complete system even if the material is not described specifically in the following documentation. All questions concerning non specified product and services will be address to the Owner’s Representative before the Contactor provides a bid. Owner expects that by accepting the Contractor’s bid proposal that they [the Contractor] have provided a competent bid for a complete solution.
- B. Product specifications, general design considerations, and installation guidelines are provided in this document. Quantities of devices, typical installation details, and mounting details will be provided as an attachment to this document. The successful vendor shall meet or exceed all requirements for the systems described in this document.

1.2 Approvals

- A. The system shall maintain the following listings and/or approvals from the following agencies:
 - 1. (UL) Underwriter’s Laboratories
 - 2. FCC Federal Communications Commission

1.3 Contractor Qualifications/Quality Assurance

- A. Safety and Indemnity
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 “1.5 A. Safety & Indemnity”.
- B. Contractor Qualifications
 - 1. Contractors will submit the necessary documentation to demonstrate their compliance with Section 270000 “1.5 B. Contractor Qualification”.
- C. Quality Assurance
 - 1. Contractor shall comply with all requirements as specified in Section 270000 “1.5 C. Quality Assurance”.
- D. Warranty
 - 1. Contractor shall comply with all requirements as specified in Section 270000 “1.8. Acceptance & Warranties”.

1.4 Submittal Documentation

- A. The successful contractor shall provide their submittal package in accordance with the Section 01 20 00 1.06 Submittal Schedule, and Section 270000 “1.6 Submittal

Documentation”.

- B. Contractor shall also include in their Submittal Package:
1. A shop drawing depicting all system components and interconnections.
 2. Control Panel button/page panel layouts.

1.5 Equivalent Products

- A. The audio systems specified have been engineered to provide superior performance and speech intelligibility and have been designed for the most accurate sound reproduction available for this environment. Contractors wishing to provide alternate systems must provide industry standard documentation to ensure the owner of similar design quality.
- B. All Product provided in this Specification are those of:
1. Speakers; Electrovoice
 2. Audio Video Controller; Extron
 3. Wire; Belden, West Penn Wire
 4. Audio Amplifier; QSC
 5. Wireless microphone; Shure, Senheisser
 6. Multi Media Player; Denon DN 300-Z
 7. Personal Listening system; Telex
 8. Power Sequencer; SurgeX
- C. Pre-Approved Equals:
1. Speakers; Electrovoice Evid Series and JBL Control Contractor Series
 2. Audio Amplifier; Electrovoice and Crown, and Yamaha
 3. Wireless microphone; Shure and Senheisser
 4. Personal Listening system; Listen Technologies
 5. Power Sequencer; Middle Atlantic, ETA, and Juice Goose
 6. Audio Mixer: TOA 9000M2 Series, Model M-9000M2 with appropriate number of D-001T and T001T input modules, also Shure SCM800.
- D. Contractors wishing to approve a system other than those specified in this document shall do so in accordance with Section 270000 “:1.7 Equivalent Products”.

1.6 Multi-use System Description Sound System Description

- A. The audio-visual system shall provide amplified audio signals from a master and remote location to overhead speakers. The system shall be setup to provide three types of venues, and provide the following functions:
- Multi-Point Array System
 - Audio mixing and switching of multiple inputs

PART 2 – PRODUCTS

The following sections specifically list the acceptable equipment types and items for this project. Where quantities are not noted, they may be obtained from the project drawings. In the event of a discrepancy between the specifications and the project drawings, the greater quantity or better quality shall be furnished.

2.1 Audio Visual System Equipment

A. Speakers for Multi-use

1. Versatile performance for mains, fills, or monitors
2. Passive crossover
3. High sensitivity, 131 dB maximum SPL
4. Power handling: 600 W continuous, 2400 W peak
5. Up to four anchor-plate attachments with M8 mounting inserts
6. Integrated handle
7. Available in black and white
8. Input Connections 2 conductor SJO cable and gland nut
9. Nominal Impedance 8 Ω
10. Speaker Type Full-range
11. Frequency Response (-3 dB) 58 - 15000 Hz
12. Frequency Response (-10 dB) 48 - 20000 Hz
13. Sensitivity 1 W/1 m 97 dB
14. Max. SPL/1m (calc) 131 dB
15. Coverage (Nominal -6 dB) H 90/60 $^{\circ}$
16. Coverage (Nominal -6 dB) V 50/60 $^{\circ}$
17. LF Transducer 12-inch DVX3121A
18. LF Power Handling 500 Watts
19. HF Power Handling 40 Watts
20. HF Transducer 2-inch ND2
21. Crossover Frequency 2000 Hz
22. Minimum Impedance 6.2 Ω
23. Enclosure Material High Impact Polystyrene
24. Height 24.13", Width 15.63", Depth 14.25"
24. Weight Net 43.65 lbs
25. Speaker shall be equal to Electrovoice ZX3

B. Audio Mixer

1. The unit shall be a analog/digital mixer.
 - 6 microphone/line inputs, plus 3 music source inputs
 - 100 V, telephone and a call station input with priority & VOX
 - 2 zones and 2-channel operation
 - Voice-activated emergency override
 - 2-tone chime built in, 7 more chimes optional with call station
 - The mixer shall have 3 stereo music source inputs on cinch connectors. The inputs shall be converted to mono. The mixer shall have a separate voice (level) activated input for 100v and tele-phone in on a balanced screw terminal. The mixer shall have a separate call station input with zone selection, preannouncement chime, priority and push to talk contact. The mixer shall be able to address two separate zones independently. The mixer shall have 2 channel operation. The mixer shall have a contact activated input selectable on input 1. This input shall accept any mic liver sour e with or without a contact output. The mixer shall have a voice activated emergency override on input two. The mixer shall have a voice activated emergency override on input two. The mixer shall have a two-tone chime builtin.
 - The output of the mixer shall be balanced line level (1V). There will be outputs

for zone 1 and for zone two on XLR connectors. The unit shall have a relay that switches with the call activation.

- Input channel 1 and 2 shall be able to take priority over all other microphone and music inputs. Input 1 shall be able to be activated by contact closure on the PTT (push to talk) input or the input shall be able to be switched automatically if a signal shall be fed to the input i.e. if someone speaks into the microphone (VOX activation). A 2-tone chime shall be able to be configured to precede an announcement. Input 2 also shall have a VOX possibility. When one or both inputs shall be configured to have priority, the amount of attenuation (reduction) of all other inputs, mic/line or cinch, shall be able to be set between 0 dB (no attenuation) and $-\infty$ dB (mute). This provides a talk over or voice over function. To increase intelligibility for announcements, input channels 1 and 2 shall also feature selectable speech filters.
- Mains power supply shall have a tolerance of $\pm 10\%$, 50/60Hz
- The battery power supply shall have a tolerance of -20% / $+10\%$
- The frequency response shall be 30 Hz to 20 kHz ($+0/ -3$ dB @ 10 dB ref. rated output)
- The Distortion shall be $<1\%$ @ rated output power, 1 kHz
- The mic/line sensitivity shall be 1 mV for the microphone setting and 200 mV for line setting
- The total dynamic range shall be more than 98 dB
- The speech filter shall have a roll of frequency of -3 dB @ 315 Hz, The mixer shall fit in a 2 unit high standard 19 rack with a depth of 270 or more, excluding connectors.
- The unit shall be the Rane MLM103

C. Audio Amplifier

1. The approved Audio Amplifier shall have:
 - Four channels in one compact rack-efficient unit
 - 500 W per channel
 - 70/100 V operation for distributed systems
 - Class-D design for optimum efficiency
 - Slot for optional RCM-810 module, allowing IRIS-Net control and monitoring
 - IRIS-Net selection of each channel's impedance (2-10 Ω in 0.1 Ω steps)
 - Rear-mounted attenuators
 - Switchable 50 Hz high-pass filter (Hi-Z mode)
 - Complete protection: thermal, overload, shorts, HF, DC, back-EMF, inrush current
 - Phoenix-type input and output connections
 - Remote power-on/off contact
 - Programmable power-on delay settings
 - Front-to-rear fans
 - CAN Bus Interface
 - Optional (RCM-810 card)
 - The approved Audio Amplifier shall be equal to Electrovoice, Model# CPS4.5.

D. Assistive Listening System shall have the following characteristics:

1. The Assistive Listening Transmitter shall feature 16 user selectable frequencies controlled by a front mounted selector switch, a headphone jack with adjustable level

for input signal monitoring, and a peak reading LED display for visual input monitoring.

2. The Transmitter shall have a balanced XLR-3F input with selectable microphone, line, and 70 volt options. The unit shall also have an unbalanced 1/4" input.
3. The Transmitter shall feature an input attenuator and hi/low RF power-switch on the back panel.
4. The System Transmitters shall meet the following performance criteria:
 - RF Frequency Range: 72 to 76 MHz
 - Modulation FM: ± 25 KHz deviation
 - Signal-To-Noise Ratio: 58 dB (64 dB A weighted)
 - Maximum Deviation: ± 25 KHz
 - Maximum Rated Power: 50 mW
 - Audio Input: Balanced XLR-3F plus unbalanced 1/4"
 - Antenna: 1/4" wave omnidirectional whip
 - Audio Controls: Audio input level, monitor jack volume
 - Power Requirements: 15-24 Vdc or 13 Vac; 115Vac 60 Hz @ 300 mA plug-in wall pack power supply
 - Dimensions: H 1-3/4" x W 7-1/2" x D 6-7/8"
 - FCC ID: B5DM508
 - Visual Indicators: 5 segment audio level LED, power ON indicator
 - RF Power Switch: 80K μ V/m @ 3 m in hi, 25K μ V/m @ 3 m in low
5. The Assistive Listening Single Channel Receivers shall operate on one of 16 fixed narrow-band frequencies in the 72-76 MHz band.
6. Receiver shall provide a recessed headphone jack and volume control.
7. Receivers shall operate on two AA batteries for up to 30 hours.
8. The System Receivers shall meet the following performance criteria:
 - Power Requirements: (2) AA batteries, Alkaline or NICAD 30 hours Alkaline, 10 hours NICAD
 - Audio Frequency Response: <3 dB Variation (100 Hz-10 KHz)
 - Sensitivity: 0.5 μ V typical, 1.0 μ V maximum, 12 dB SINAD
 - Signal-To-Noise (@ 1 mV Input): >60 dB
 - Distortion: <2% T.H.D.
 - Audio Output @ 10% distortion:
 - into 8 Ohms: 2.0V/15mW 3.0V/80mV into 32 Ohms: 2.0V/10mW 3.0V/50mW
 - Antenna Type: 1/4 Wave Omni-directional, in earphone cord
 - Controls: Volume/On/Off Switch
 - Dimensions: H 4" x W 2-3/4" x D 1"
 - Visual Indicators: Backlit On/Tuning indicator
 - External Jack: 3.5mm Audio Output/Charger
 - FCC ID: B5DE401
 - The approved Personal Listening system shall be equal to Telex, Model# ST-300. Contractor will provide one (1) Battery Charger, Telex # BC-100.

* *To meet ADA requirements Contractor will provide 4% of the building occupancy with listening devices (SR-50) & ear buds (SEB-1).*

E. Wireless Microphone

1. The approved Wireless Microphone shall have:
 - Autoscan on all receivers for simple and secure frequency selection
 - 1440 frequencies within a 36MHz switching bandwidth for greater tuning flexibility
 - Robust metal construction for durability
 - Smaller bodypack transmitters and receivers (30% smaller than current EW)
 - Pilot tone squelch (defeatable for backwards compatibility with original EW systems)
 - New battery concept (AA cells and rechargeable battery accessories)
 - Transmitter battery status telemetry on all models
 - Audio signal metering on transmitter LCD display
 - External charging contacts on 300 and 500 series bodypacks
 - XLR jacks on all rack-mountable units (including 100 series)
 - Provide ASP2 Antenna Combiner
 - Provide NT1 Main Power Unit
 - Provide GA 2 Rack Mount Kit
 - Provide A-1031-U Omni Directional Antenna
 - Provide AM2 Cable Kit
 - Provide AB2 Booster Kit

2. Provide two wireless microphones

- Two handheld microphone equal to Sennheiser ew335G3

* *Contractor will provide all necessary rack mounting kits and required accessories. Contractor shall include all power supplies, BnC cables, Antenna's, and mounting hardware.*

F. Hand Held Microphone & Accessories:

1. The approved Hand Held Microphone shall have:
 - Transducer Type: Condenser (electret bias)
 - Frequency Response: 50 to 18,000 Hz
 - Polar Pattern: Cardioid
 - Output Impedance: 150 Ohms at 1 kHz Recommended minimum load impedance: 600 Ohms
 - Sensitivity (at 1,000 Hz) Open Circuit Voltage: -50 dBV/Pa (3.15 mV) (1 Pa = 94 dB SPL)
 - Output Clipping Level: 1000 Ohm Load at 1,000 Hz: +3 dBV (1.41 V)
 - Maximum SPL (at 1,000 Hz): 1000 ohm load (1% THD): 147 dB
 - Self-Noise: 23 dB typical, A-weighted
 - Dynamic Range (1000 ohms): 124 dB (maximum SPL to A-weighted noise level)
 - Signal-to-Noise Ratio: 71 dB at 94 dB SPL (IEC 651)*
 - *S/N ratio is difference between 94 dB SPL and equivalent SPL of self-noise A-weighted.
 - Polarity: Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of the output connector.
 - Phantom Supply Requirement: 11 to 52 Vdc, positive at both pins 2 and 3 Current Drain: 5.2 mA
 - Connector: Three-pin (XLR) professional audio

- Case: Dark gray enamel-painted steel with matte-finished silver colored steel grille
 - The approved Hand Held Microphone shall be equal to Shure, Model# SM86. Contractor to provide a quantity of two (2).
2. Full Length Microphone Stand.
- The Microphone Stand shall be constructed of 5/8" and 7/8" dia. heavy-duty welded cold rolled steel tubing with 5/8" - 27male thread termination to accommodate standard microphone holders and accessories.
 - Top and bottom lock-nut rings will be included for versatile and secure positioning.
 - The entire assembly shall be finished in non-reflective ebony epoxy.
 - The approved Full Length Microphone Stand shall be equal to Atlas Sound, Model # MS-12CE. Contractor to provide a quantity of two (2).
3. Microphone Cable.
- Microphone Cables shall be Heavy-duty, 25 foot (7.5 m), balanced cable for low-impedance operation.
 - Cables will feature black connectors on microphone end for low visibility.
 - The approved Microphone Cables shall be equal to Shure, Model# C25B. Contractor to provide a quantity of four (4).

G. Electrical Power Equipment

1. The approved Power Sequencer shall have:
- Shall be a two-rack-space unit in a magnetic shielding steel enclosure.
 - Shall operate from 120 volts AC and have a 9-foot, grounded, 3-wire #12 line cord.
 - There shall be 12 grounded AC receptacles in three banks of four on the rear panel, each bank sequenced from the previous bank by an adjustable 0 - 40 second delay, and two receptacles always on.
 - Control Inputs: Momentary Switch, Latching Switch,
 - Contact Closure or 5-30 Vdc
 - Input Control Current: 3 mA
 - DC Voltage Output: 12 Vdc, 40 mA maximum load
 - Auxiliary Relay Output: 1 amp, 30 Vdc
 - There shall be a back-lit LCD display that shows unit status and AC line voltage, and two screwdriver adjustments to program the unit.
 - Overall dimensions shall be 3.5" H x 19" W x 10.5"D.
 - Weight shall be 16 pounds.
 - Shall have a load rating of 20 amps at 120 volts, a self-test circuit with visual indicator and provide EMI/RFI filtering, inrush current elimination and catastrophic over/under-voltage shutdown.
 - It shall meet Federal Grade A, Class 1, Mode 1 guidelines for powerline surge suppressors and withstand at least 1000 occurrences of surge pulse voltages up to 6000 volts.
 - Thermal circuit breaker overload protection
 - 10-year warranty
 - Made in U.S.A.
 - The approved Power Sequencer shall be equal to the SurgeX, Model# SEQ.

2. The approved Secondary Power Strip shall have:
 - Shall be a one-rack-space unit in a magnetic shielding steel enclosure.
 - Shall operate from 120 volts AC and have a 9-foot, grounded, 3-wire #14 line cord.
 - There shall be 8 grounded AC receptacles on the back panel, with 6 switched and 2 always on.
 - There shall be connectors and a dimmer for 2 Littlite gooseneck lamps on the front panel.
 - Overall dimensions shall be 1.75" H x 19" W x 10.5" D.
 - Weight shall be 11 pounds.
 - Shall have a load rating of 15 amps at 120 volts, a self-test circuit with visual indicator, and provide EMI/RFI filtering, inrush current elimination and catastrophic over/under-voltage shutdown.
 - It shall meet Federal Grade A, Class 1, Mode 1 guidelines for powerline surge suppressors and withstand at least 1000 occurrences of surge pulse voltages up to 6000 volts.
 - Thermal circuit breaker overload protection
 - Self-test circuit with visual indicator
 - 10-year warranty
 - Made in U.S.A.
 - The approved Power Sequencer shall be equal to the SurgeX, Model# SX1115RL.

* *Contractor will provide TWO (2) Littlite LED Gooseneck with 3-pin, right angle XLR connector. MODEL:12XR-LED*

H. Sound Equipment Cabinet

1. The approved SER cabinet shall have:
 - Rotating design allows enhanced access to rear equipment, simplifying wiring
 - UL Listed in the US and Canada
 - Host enclosure can be pre-installed on-site while detachable rack frame is integrated with equipment off-site, simplifying installation
 - 26" useable depth, rack frame is housed in a 32-7/8" deep host enclosure
 - 750 lb. weight capacity with proper weight distribution
 - 44 space rack frame height
 - Effective cable management system provided
 - Knockouts provided for cable pass-through and ganging multiple racks
 - Engineered ventilation locations optimize passive heat convection
 - Configurable open top accepts a number of options for active thermal management
 - Standard front and rear 11-gauge, 10-32 threaded rackrail with marked rackspace increments
 - Slide out rotating rack system
 - Rear Access Panels available for rear security or to maximize potential of active thermal management
 - The approved Sound Equipment Cabinet shall be equal to the Middle Atlantic, Model# SR-44-32.
 - Contractor will provide the following Sound System Rack Accessories. Provide quantities as listed and shown on the project drawings, unless otherwise noted:
 - Front Door; Vented Plexi-Glass, equal to Middle Atlantic #PVFD-44
 - Duct cool adapter top, equal to Middle Atlantic #MW-DT

- Horizontal Mount Fan Panel with Thermostatic speed control, equal to Middle Atlantic #UQFP-4D.
- Power Sequence Controller, equal to Middle Atlantic #USC-6R.
- Vertical Power Strip, equal; to Middle Atlantic, #MPR-6 quantity (1) one, #RLM-20-1C quantity (1) one, #R-20 quantity (5) five, #J-24X6 quantity (1) one, and #T-80X6 quantity (1) one.
- Horizontal Power Distribution Panel, equal to Middle Atlantic #PD-920R- NS.

2. Cabinet Accessories

- Rack mount Lockable Drawer, equal to Middle Atlantic #D4LK.
- Universal Connector Panel, equal to Middle Atlantic # UNI-1-C
- Blank panels, equal to Middle Atlantic # EB1 1-3/4" (1 space), EB2 3-1/2" (2 space), EB3 5-1/4" (3 space), EB4 7" (4 space), EB5 8-3/4" (5 space), EB6 10-1/2" (6 space)
- Standard Rack Screws, equal to Middle Atlantic # HP-500

I. Wire & Cables Audio Cable

1. The approved Ceiling Speaker Cable shall be:
 - 18awg stranded (7x26awg) ASTM bare copper
 - 2 conductor twisted pair cable with PVC insulation and a Gray PVC jacket.
 - The approved Speaker Cable shall be equal to West Penn, PN# 224.
2. The approved low frequency Speaker Cable shall be:
 - 12awg stranded (19x25awg) ASTM bare copper
 - 2 conductor twisted pair cable with PVC insulation and a Gray PVC jacket.
 - The approved Game Speaker Cable shall be equal to West Penn, PN# 227.
3. The approved Microphone Cable shall be:
 - 20awg stranded (7x28awg) ASTM tinned copper
 - 2 conductor twisted pair cable with PVC insulation and a Gray PVC jacket.
 - Cable shall have an overall 100% aluminum polyester foil shield and a 22awg tinned copper drain wire.
 - The approved Microphone Cable shall be equal to West Penn, PN# 292.
4. The approved inter-rack cabling shall be:
 - 20awg stranded (7x28awg) ASTM tinned copper
 - 2 conductor twisted pair cable with PVC insulation and a Gray PVC jacket.
 - Cable shall have an overall 100% aluminum polyester foil shield and a 22awg tinned copper drain wire.
 - The approved cable shall be equal to West Penn, PN# 452
 - Connectors: 3.5mm Stereo Male to 3.5mm Stereo Male
 - Fully molded connectors provide strain relief
 - Braided shield prevents unwanted EMI/RFI interference
 - Nickel-plated connectors
 - The approved cable shall be equal to Cables To Go, PN# 40412
 - Connectors: (2) RCA Male Plug to (2) RCA Male Plug
 - Bonded construction design for neat, easy connection of audio signals
 - Oxygen-free copper conductors deliver high-quality audio
 - 100% foil and OFC shield protects against noise and interference
 - Twisted pair construction of audio conductors fight noise and hum.

- Corrosion-resistant, precision 24K gold-plated connectors ensure long-lasting quality
- Ultra-flexible jacket for easy installation
- The approved cable shall be equal to Cables To Go, PN# 13032
- Connectors: 3.5mm Stereo Male to 2x RCA Stereo Male
- Fully molded connectors provide strain relief
- Foil shielded to prevent unwanted EMI/RFI interference
- Gold-Plated connectors
- The approved cable shall be equal to Cables To Go, PN# 40613

J. Installation Components

1. Mic and Line Device Outlets:

- Input: 3-pin female XLR-type, RCA (phono) type and 1/4" TRS jacks where shown on Drawings.
 - Microphone receptacles shall be Switchcraft J3FS or equal by Neutrik
- Insulate RCA and TRS jacks from plate, do not ground pin 1 on XLRs.
- Output: 3-pin male XLR-type, RCA (phono) type, and 1/4" TRS as specified above.

2. Terminal Blocks:

Loudspeaker and DC Control Lines:

- Terminal blocks providing any of these sets of features:
- Screw-clamp-type terminals with wire guards, designed for max. 8 AWG wires.
- Min. 9/16 in. terminal centers with barriers, 8-32 x 5/16 binder head screws, and closed bottom.
- Variable length modular system designed for wire sizes AWG No. 22 to No. 10, with dual head screws and barrier, retaining track, and end stops no greater than 20 blocks apart.
- Acceptable Products:
 - Electrovert 16 EDS.
 - TRW Cinch Connectors 542 series.
 - AMP Special Industries FLEXI-BLOCK 8 Series Terminal BlockSystem.

3. Connectors:

Microphone and Line Connectors (Panel Mount):

- Balanced Input Receptacles: female gender "XLR"-type receptacles.
 - Acceptable Products:
 - Switchcraft C3F or D3F.
 - Equivalent by Neutrik
- Balanced Output Receptacles: Male gender "XLR"-type receptacles.
 - Acceptable Products:
 - Switchcraft C3M or D3M.
 - Equivalent by Neutrik

Microphone and Line Connectors (Cable Mount):

- Balanced Input Connectors: female gender "XLR"-type connectors.
 - Acceptable Products:

- Switchcraft A3F.
- Neutrik NC3FX.
- Balanced Output Connectors: male gender “XLR” type connectors.
 - Acceptable Products:
 - Switchcraft A3M.
 - Neutrik NC3MX.

PART 3 – EXECUTION

3.1 General

- A. All Work described in this specifying document and on the project drawings shall be performed in accordance with the acknowledged Professional and Industry standards and practices. All installed equipment shall meet and/or exceed the specified manufactures’ regulations.
- B. The Contractor shall maintain a competent supervisor and Manufacture Certified Technician assigned to this installation for the duration of the Project.
- C. Furnish and install all materials, devices, components, and equipment required for a complete and operational system.
- D. It is the contractor’s obligation to inform the Owner and/or the Owner’s Representative of any and all conflicts between the project documents and the onsite conditions.
- E. It is the Contractor’s responsibility and obligation to coordinate with all necessary trades to ensure the integrity and compliance of the Manufacture and Industry standards are meet during the duration of the installation.

3.2 Installation

- A. Furnish components, racks, wire, cabinetry, connectors, materials, parts, equipment, labor, etc. necessary for the complete installation of the systems in full accordance with the recommendations of the equipment manufacturers and the requirements of the drawings and specifications.
- B. Installation shall follow standard broadcast wiring and installation practice and shall meet or exceed industry standards for such work.
- C. Wire not installed in equipment racks, not portable, unrated ceiling space, or not installed in conduit shall be fire rated and meet all applicable codes.
- D. All signal equipment control cables shall be stranded wire, appropriately shielded, of gauge and number of conductors required by the manufacturer for proper operation of the system or equipment item furnished.
- E. All cables including control, network, low-voltage power, video and audio which are required to be on floor will be properly covered and secured so that they are protected by

strain and safe of trip hazards.

- F. Wire and cable for all other devices shall be supplied in accordance with the recommendations of the device manufacturer and the National Electrical Code.
- G. Equipment shall be held firmly in place with proper types of mounting hardware. All equipment affixed to the building structure must be self-supporting with a safety factor of at least three. All equipment shall be installed so as to provide reasonable safety to the operator. Supply adequate ventilation for all enclosed equipment items which produce heat.
- H. Furnish the system to facilitate expansion and servicing using modular, solid-state components. All equipment shall be designed and rated for continuous operation and shall be UL listed, or manufactured to UL standards.
- I. Shields of audio cables shall be grounded at one end only, at the inputs of the various equipment items in the system.
- J. Observe proper circuit polarity and loudspeaker wiring polarity. No cables shall be wired with a polarity reversal between connectors with respect to either end. Special care shall be taken when wiring microphone cables, to ensure that constant polarity is maintained.
- K. Terminate all unused inputs and outputs with proper precision shielded resistors.
- L. Route cables and wiring within equipment racks and cabinetry according to function, separating wires of different signal levels (video, microphone, line level, amplifier output, AC, control, etc.) by as much physical distance as possible. Neatly arrange and bundle all cables loosely with Velcro cable ties. Cables and wires shall be continuous lengths without splices.
- M. All system wire, except spare wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. No unterminated wire ends will be accepted. Heat shrink type tubing shall be used to insulate and dress the ends of all wire and cables. Include a separate tube for the ground or drain wire.
- N. All cables in conduits shall be insulated from each other and from the conduit the entire length and shall not be spliced. All cables and wires are to be continuous lengths without splices.
- O. All solder joints and terminations shall be made with resin-core silver solder. Temperature regulated soldering irons rated at least 60 watts shall be used for all soldering work. No soldering guns or temperature unregulated irons shall be used on the job site.
- P. Mechanical connections shall be made using approved connectors of the correct size and type for the connection. Wire nuts will not be accepted.
- Q. Each mechanical connector shall be attached using the proper size controlled-duty-cycle ratcheting crimp tool which has been approved by the manufacturer of the connectors.

- R. Conventional non-ratcheting type crimping tools are unacceptable and shall not be used on the job site.
- S. Label all wires in racks and console as to destination and purpose. Clearly and permanently label all jacks, controls, and connections with permanent engraved laminated plastic labels or by engraving and filling mounting plates, unless otherwise noted. Attach laminated plastic labels with contact cement, being careful to clean off excess or visible cement. Embossed or printed label tape, and press-on or lift-off lettering systems will not be accepted. All labeling shall be completed prior to final system inspection.
- T. Provide a #6 AWG insulated copper ground wire from the main equipment to the building main ground bus.

3.3 Programming

- A. Contractor shall provide all necessary programming to provide a complete operating Audio System.
- B. Contractor shall include in their bid three (3) two (2) hour planning meetings with the owner and their Representatives to outline all specific programming issues, as well as, but limited to:
 - 1. Contractor will be informed of any specific requirements for use of the system.
 - 2. Contractor will provide overview of system capabilities.
 - 3. Contractor will address all concerns of the Owner and their Representatives.
- C. All Crestron Control System Programming shall be custom produced for this installation by qualified factory-trained installer and software support shall be provided to owner for 12 months after the final acceptance of this project. Contractor to work with the Owner's staff to assign IP addresses and set-up Crestron & other A/V equipment. Software must be capable of scheduling and troubleshooting over the network connection.

3.4 Testing

- A. The completed AV systems shall be physically inspected by the Owner's representative to assure that all equipment is installed in a neat and professional manner, and in accordance with these Specifications.
- B. The final system testing and commissioning shall be performed after all installation and initial testing has been completed by the Installer, but prior to any use of the systems.
- C. The Contractor, prior to requesting systems testing and demonstration to the Owner's representative, shall ensure that all systems are in first-class working condition and free of short circuits, ground loops, parasitic oscillations, excessive hum and noise, RF interference, or instability of any form.
- D. The Contractor shall be responsible for properly performing all setup and alignment of systems, and all assembly and setup of portable equipment.
- E. The Installer shall be responsible for properly performing the equalization of the sound

system. After equalization and test the sound system shall meet or exceed the following specifications:

- System shall be free of short circuits, ground loops, parasitic oscillation, excessive system noise, hum, RF interference, and instability of any form.
- Maximum SPL with band-limited pink noise input to the system shall be 99dB before audible distortion occurs.
- Acoustic response of the system shall be plus or minus 1.5dB along a line which is flat from 80Hz to 4000Hz and which rolls off at 1dB per octave to 16kHz.

3.5 System Commissioning

A. Audio Visual System Commissioning

1. In the presence of the Owner's Representative the Contractor shall perform the attached functions listed below:
 - (1) Check calculated Sound Pressure Levels (SPL) readings at seating
 - (2) Inspection of equipment racks for neatness and proper termination
 - (3) Inspection of all terminations
 - (4) Inspection of all W/P connections
 - (5) Inspection of all inputs and output devices
 - (6) Verify bandwidth of sound system
 - (7) Verify polarity of speaker system and connectors
 - (8) Check wire types at all locations
 - (9) Verify connector types
 - (10) Check Impedance of speaker line
 - (11) Verify frequency response of speaker system with RTA
 - (12) Verify coverage of speaker system
 - (13) Contractor must provide man lift to speaker location
 - (14) Contactor must provide access to all termination points
 - (15) Check cooling system in equipment rack
 - (16) Check general operation of control surface
 - (17) Check programming of control surface for routing and proper function
 - (18) Check power sequencing
2. All testing documentation will be supplied as a part of the Contractors As-built Documentation.

B. Contractor will include in their bid price six (6) hours for onsite commissioning. Contractor will provide the installation technician who was responsible for this project to be present at the system commissioning to tune, fix, repair, replace all system components that do not operate within the tolerance as set forth in this specification, the project documents, and industry standards.

C. The final acceptance of the system by the Owner will be based upon the report of the Owner representative following inspection, testing, and commissioning. A list of items in need of completion or correction shall be generated by the owner, which must be corrected by the Installer before final acceptance will be granted.

3.6 Training

- A. Contractor shall provide no less than three (3) two (2) hour training sessions.
 - 1. The first training session will be a “Train the Trainer”. The owner will appoint their representative to be provided extensive training so that he/she will be able to provide additional support once the project has been completed.
 - 2. The additional training session will be provided as a general overview of the system operation for large groups or several smaller groups as designated by the owner. Typically, these additional training events will coincide with a school function when the sound system will be used.
 - 3. Provide sign-in sheets for all training events. Deliver to architect in the close out documents.
- B. Contractor shall provide no less than four (4) secondary training sessions as requested by the owner. These secondary training sessions will be for specific owner requests and needs based on usage. There shall be no additional charge for these training sessions during the first year of warranty.

3.7 Warranty

- A. Contractor will provide a minimum of a 1 year Workmanship Warranty that includes Parts and Labor.
- B. All equipment provided under this specification shall be warranted to be free from defects in materials and workmanship for a period of 12 months from notice of completion.
- C. The Contractor shall maintain regular service facilities and provide a qualified technician familiar with the work specified for this project. Contractor will respond to all notice of malfunction from the Owner within 24 hours of receiving trouble call. As part of this warranty, the Contractor shall provide, at no expense to the Owner, all material, devices, equipment, and personnel necessary and resolve malfunction and/or to provide alternate facilities, services, or equipment for the duration of repairs to any defective work as described in this section.
- D. All repairs and service under warranty shall be at the jobsite unless in violation of manufacturer's warranty, wherein contractor shall provide substitute equipment for the duration of repairs. Transportation of substitute or test equipment and personnel to and from the jobsite shall be at no expense to the owner.
- E. All repair and service work under warranty work, except emergency repairs can be performed during regular working hours of regular working days. Emergency repairs shall be made when a system or component malfunctions during use, and shall be performed on an immediate basis. All work shall be performed by personnel in the employ of contractor, having specific experience in the work of this specification and shall not be subcontracted or assigned to another company for service, unless Owner has approved such assignment in writing, in which event contractor shall nevertheless be responsible to the Owner for such work.

3.8 System Documentation

- A. Upon completion of the installation, the contractor shall provide four copies (one hardcopy and three electronic copies) of Project Close-Out Documents to the Owner. Documentation shall include the items detailed in the sub-sections below:
1. Maintenance and Operation Manuals
 2. All System source codes and passwords (Crestron Processor Program and Touch Panel Program) must be handed over to and become property of the Owner upon completion of this project.
 3. As-Built Drawings
- B. The As-Built drawings are to include Rack Elevations, Back Board Layout, Equipment Layout and System Single Line Drawings.

END OF SECTION

FIRE DETECTION AND ALARM

PART 1 – GENERAL

1.01 RELATED SECTIONS

- A. Section 26 05 00 – Common Work Results for Electrical
- B. Section 26 20 00 – Low Voltage Electrical Transmission
- C. Section 27 00 00 – Communications
- D. Section 28 00 00 – Electronic Safety and Security

1.02 REFERENCES

- A. Electrical Industries Association (EIA):
 - 1. EIA-232-D – Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange
 - 2. TIA-485-A – Electrical Characteristics of Generators and Receivers for Use in Balanced Multipoint Systems
- B. California Code of Regulations
 - 1. Title 24, Part 3 – California Electrical Code (CEC)
- C. National Fire Protection Association (NFPA):
 - 1. NFPA 12 – Standard on Carbon Dioxide Extinguishing Systems.
 - 2. NFPA 13 – Installation of Sprinkler Systems.
 - 3. NFPA 15 – Standard for Water Spray Fixed Systems for Fire Protection.
 - 4. NFPA 16 – Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems.
 - 5. NFPA 16A – Standard for the Installation of Closed Head Foam-Water Sprinkler Systems.
 - 6. NFPA 70 – National Electrical Code (NEC)
 - 7. NFPA 72 – National Fire Alarm Code.
 - 8. NFPA 90A – Standard for the Installation of Air Conditioning and Ventilating Systems.
 - 9. NFPA 101 – Life Safety Code.
 - 10. NFPA 750 – Standard on Water Mist Fire Protection Systems.
 - 11. NFPA 5000 – Building Construction and Safety Code.
- D. Underwriters Laboratories (UL):
 - 1. UL 268 – Standard for Smoke Detectors for Fire Alarm Signaling Systems.
 - 2. UL 864 – Standard for Control Units and Accessories for Fire Alarm Systems.
 - 3. UL 1971 – Standard for Signaling Devices for the Hearing Impaired.

1.03 SCOPE OF WORK

- A. Furnish all labor, equipment, and materials for, and comply with the performance requirements of the Fire Alarm System indicated in the drawings and specified herein.
- B. It is the intent of the Contract Documents to provide an installation complete in every respect. In the event that additional details or special construction is required to accomplish work indicated or specified in this or other sections, it shall be the responsibility of the Contractor to provide all materials and equipment which is usually furnished with such systems in order to complete the installation, whether or not specifically mentioned herein.

1.04 SYSTEM DESCRIPTION

- A. A new intelligent reporting, fully peer-to-peer, microprocessor-controlled fire detection and notification system shall be installed in accordance with the specifications and as indicated on the Drawings.
- B. Basic Performance:
 - 1. Network Communications Circuit Serving Network Nodes: Connected using approved fiber optic cable or 18/2 twisted pair copper cable between nodes.
 - 2. Signaling Line Circuits (SLC) Serving Addressable Devices: Wired Class B.
 - 3. Initiation Device Circuits (IDC) Serving Non-addressable Devices Connected to Addressable Monitor Modules: Wired Class B.
 - 4. Notification Appliance Circuits (NAC) Serving Strobes and Horns: Wired Class B.
 - 5. Alarm Signals Arriving at Control Panel: Not lost following primary power failure until alarm signal is processed and recorded.
 - 6. Network Node Communications:
 - a. Communicated between panels on fiber optic cables.
 - b. To enhance system survivability, ability to operate on loss of Command Center, short or open of entire riser at Command Center shall be demonstrated at time of system acceptance testing.
 - c. Systems that are not capable of providing true Style 7 riser performance shall not be acceptable.
 - 7. Signaling Line Circuits (SLC):
 - a. Reside in remote panels with associated audio zones.
 - b. SLC modules shall operate in peer-to-peer fashion with all other panels in system.
 - c. On loss of Command Center, each remaining panel shall continue to communicate with remainder of system, including all SLC and control functions. Systems that provide a "Degraded" mode of operation upon loss of Command Center or short in riser shall not be acceptable.
 - d. Limit the number of devices to 80% of the maximum allowed of each type on SLC circuits.
 - 8. Notification Appliance Circuits (NAC), and Control Equipment:
 - a. Arranged such that loss of any 1 NAC circuit will not cause loss of any other NAC circuit in system.
 - b. Electrically supervised for open and short circuit conditions.
 - c. If short circuit exists on NAC circuit, it shall not be possible to activate that circuit.
 - d. Voltage drop is not to exceed 10% at the furthest point on any NAC circuit.

9. Standby Power:
 - a. Provide a minimum of 20% spare battery capacity above calculated requirements.
- C. Sequence of Operations:
1. General Alarm: Upon alarm activation of any area smoke detector, duct smoke detector, heat detector, manual pull station, or sprinkler water flow switch, the following functions shall automatically occur:
 - a. The internal audible device shall sound at the control panel or command center.
 - b. The LCD Display shall indicate all applicable information associated with the alarm condition including zone, device type, device location and time/date.
 - c. All system activity/events shall be documented on the system printer.
 - d. Any remote or local annunciator LCD/LED's associated with the alarm zone shall be illuminated.
 - i. The notification signals and actions shown on the plans shall occur simultaneously.
 - ii.
 2. Supervisory Operation: Upon supervisory activation of any sprinkler valve supervisory switch, fire pump off-normal, clean agent fire suppression system trouble, the following functions shall automatically occur:
 - a. The internal audible device shall sound at the control panel or command center.
 - b. The LCD display shall indicate all applicable information associated with the supervisory condition including; zone, device type, device location and time/date.
 - c. All system activity/events shall be documented on the system printer.
 - d. Any remote or local annunciator LCD/LED's associated with the supervisory zone shall be illuminated.
 - e. Transmit signal to the central station with point identification.
 3. Trouble Operation: Upon activation of a trouble condition or signal from any device on the system, the following functions shall automatically occur:
 - a. The internal audible device shall sound at the control panel or command center.
 - b. The LCD keypad display shall indicate all applicable information associated with the trouble condition including; zone, device type, device location and time/date.
 - c. All system activity/events shall be documented on the system printer.
 - d. Any remote or local annunciator LCD/LED's associated with the trouble zone shall be illuminated.
 - e. Transmit signal to the central station with point identification.
 4. Monitor Operation: Upon activation of any device connected to a monitor circuit (fire pump/emergency generator status), the following functions shall automatically occur:
 - a. The LCD display shall indicate all applicable information associated with the status condition including; zone, device type, device location and time/date.
 - b. All system activity/events shall be documented on the system printer.
 - c. Any remote or local annunciator LCD/LED's associated with the status zone shall be illuminated.
- D. Fire Alarm System Functionality:
1. Provide complete, electrically supervised distributed, networked analog/addressable fire alarm and control system, with analog initiating devices.

2. Each Network Node: Incorporate Boolean control-by-event programming, including as a minimum AND, OR, NOT, and Timer functions.
3. Control Panels: Capability to accept firmware upgrades via connection with laptop computer, without requirement of replacing microchips.
4. Network:
 - a. Based on peer-to-peer token ring technology operating at 625 K baud, using Style 7 configuration.
 - b. Capability of using twisted-pair wiring, pair of fiber optic cable strands up to 200 microns, or both, to maximize flexibility in system configuration.
5. Each Network Node:
 - a. Capability of being programmed off-line using Windows-based software utilized by fire alarm system manufacturer. Capability of being downloaded by connecting laptop computer into any other node in system. Systems that require system software to be downloaded to each transponder at each transponder location shall not be acceptable.
 - b. Capability of being grouped with any number of additional nodes to produce a “Region”, allowing that group of nodes to act as 1, while retaining peer-to-peer functionality. Systems utilizing “Master/Slave” configurations shall not be acceptable.
 - c. Capability of annunciating all events within its “Region” or annunciating all events from entire network, on front panel LCD without additional equipment.
6. Each SLC Network Node: Capability of having integral DACT (digital alarm communicator transmitter) that can report events in either its region, or entire network to single central station monitoring account.
7. Each Control Panel: Capability of storing its entire program and allow installer to activate only devices that are installed during construction, without further downloading of system.
8. Password Protection: Each system shall be provided with 4 levels of password protection with up to 16 passwords. Passwords shall be provided to owner.

1.05 QUALITY ASSURANCE

- A. To ensure reliability and complete compatibility, all items of fire alarm system, including control panels, power supplies, initiating devices, and notification appliances, shall be listed by Underwriters Laboratories Inc. (UL) and shall bear the “UL” label.
- B. Fire Alarm Control Panel Equipment: UL-listed under UL 864 Ninth Edition.
- C. Equipment, Programming, and Installation Supervision:
 1. The contractor is required to hold a C-10 license and any other certifications required by the Authority Having Jurisdiction.
 2. The contractor is required to be an approved engineered systems distributor of Gamewell-FCI for equipment, programming, and installation supervision.
 3. Proof of factory training shall be delivered within 14 calendar days of award of the Contract.
- D. Software Modifications:
 1. Provide services of Notifier factory-trained and authorized technician to perform system software modifications, upgrades, or changes.

2. Provide use of all hardware, software, programming tools, and documentation necessary to modify fire alarm system software on-site.
3. Modification includes addition and deletion of devices, circuits, zones, and changes to system operation and custom label changes for devices or zones.
4. System structure and software shall place no limit on type or extent of software modifications on-site.
5. Modification of software shall not require power-down of system or loss of system fire protection while modifications are being made.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- C. Handling: Protect materials from damage during handling and installation.

1.07 COORDINATION

- A. Coordinate the Work of this section with the Work of other sections, including sprinkler systems, elevators, HVAC systems, and security/door locking systems, as applicable.

1.08 WARRANTY

- A. Warranty Period for System Equipment: 1 year from date of final acceptance.
- B. Trouble Calls: The contractor shall guarantee on-site service for the Fire Alarm System within 24 hours of the receipt of a trouble call.

1.09 SUBMITTALS

- A. Shall be in accordance with section 280000 and the General Conditions.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Refer to the plans for manufacturers and part numbers.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and surfaces to receive fire alarm system.
 1. Notify Architect of conditions that would adversely affect installation or subsequent use.

2. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

- A. Install fire alarm system in accordance with NFPA 72, NFPA 70, state and local codes, manufacturer's instructions, and as indicated on the Drawings.
- B. Smoke detectors shall neither be installed within 36 inches of any HVAC supply or return air grille, to include air handling light fixtures, nor within 12 inches of any wall.
- C. Smoke detectors shall not be installed before system programming and test period. If construction is ongoing during this period, take measures to protect smoke detectors from contamination and physical damage.
- D. Wall mounted notification appliances shall be installed not lower than 80 inches and not higher than 96 inches, above finished floor. Devices shall be not be mounted within 6 inches of the ceiling.
- E. All fire alarm devices shall be accessible for periodic maintenance. Should a device location indicated in the Contract Documents not meet this requirement, it shall be the responsibility of the Contractor to bring it, in writing, to the attention of the Engineer.
- F. Flush-mount fire detection and alarm system devices, control panels, and remote annunciators in finished areas. Flush-mount or surface-mount fire detection and alarm system devices, control panels, and remote annunciators in unfinished areas.
- G. Ensure manual stations are suitable for surface mounting or semi-flush mounting as indicated on the Drawings. Install stations at 48 inches above finished floor, measured to operating handle.
- H. End of Line Resistors shall be furnished as required by the manufacturer. Devices containing end-of-line resistors shall be appropriately labeled so as not to require removal to identify the EOL device.
- I. Addressable modules shall be mounted within 36 inches of the monitored or controlled point of termination. This shall include, but is not necessarily limited to, fan shutdown, elevator recall, shunt trip, sprinkler status points, or door release. Label all addressable modules as "FIRE ALARM SYSTEM" and to their function, e.g., "FAN F-1 SHUTDOWN".
- J. Conduit/Raceways, Junction Boxes:
 1. All systems and system components listed to UL864 Control Units for Fire Protective Signaling Systems may be installed within a common conduit raceway system, in accordance with the manufacture's recommendations. System(s) or system components not listed to the UL864 standard shall utilize a separate conduit raceway system for each of the sub-systems.
 2. The fire alarm system cabling / wiring shall be installed in RED color conduit, minimum size 3/4". In upgrade projects, existing fire alarm system conduit may be reused, if serviceable. Paint existing conduits red to match new.
 2. All junction box covers shall be painted red.
 2. Minimum conduit size shall be 3/4" trade size.

3. Conceal conduit, junction boxes, and conduit supports and hangers in finished areas. Conceal or expose conduit, junction boxes, and conduit supports and hangers in unfinished areas. Concealed installation is preferred wherever possible.

K. Cables & Conductors:

1. Cables & conductors shall be labeled at both ends as to their origin and destination; e.g. "FACP - i1-1" indicates the origin as the FACP and the destination as initiation device "i1-1". Utilize Panduit labels (or equivalent), size MP-150c through MP-350, as required by the amount of information on the label.
2. Splices in wiring are permitted only at terminal cabinets, or locations specifically approved by the Engineer. Do not splice in conduit, pull boxes, inaccessible locations, etc.

L. Terminal Cabinets:

1. Wiring shall be neatly bundled, fanned, tagged, and laced. Leave minimum three inches fan space between terminal block connection and vertical wiring. Incoming wiring shall terminate on the left, outgoing on the right.
2. Wire terminations at devices and terminal strips shall be "spade" type terminal connections, Sta-Kon, or equivalent.
3. Terminal barrier strips shall be Cinch 142 series (or equivalent) with minimum six points. Leave minimum two space separation between types of system cables. Provide minimum four spare termination points.

- M. Coordinate the required space in the Data equipment frames with this and other network based systems. Provide racks with sufficient space to accommodate all systems.

3.03 SYSTEM UPGRADES

- A. When upgrading an existing system, the existing fire alarm shall be tested in the presence of an assigned representative of Central Unified School District prior to any work being started by a contractor. Upon completion of testing, it shall be the contractor's responsibility to note any discrepancy with the existing system. It will be contractor's responsibility to provide and complete a working system, minus any discrepancies noted.
- B. When upgrading an existing system, all end of line resistors shall be changed out to meet the manufacturer's specifications for each fire panel. Install the latest software updates on existing equipment to be reused.
- C. When specifications call for the removal of existing equipment, that equipment shall be returned to the District.

3.04 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Provide service of competent, factory-trained technician authorized by manufacturer to technically supervise and participate during pre-testing and acceptance testing of system.

B. Testing:

1. Conduct complete visual inspection of control panel connections and test wiring for short circuits, ground faults, continuity, and insulation before energizing cables and wires.
2. Close each sprinkler system control valve and verify proper supervisory alarm at Control Panel.
3. Verify activation of flow switches.
4. Open initiating device circuits and verify that trouble signal actuates.
5. Open signaling line circuits and verify that trouble signal actuates.
6. Open and short notification appliance circuits and verify that trouble signal actuates.
7. Ground initiating device circuits and verify response of trouble signals.
8. Ground signaling line circuits and verify response of trouble signals.
9. Ground notification appliance circuits and verify response of trouble signals.
10. Check installation, supervision, and operation of intelligent smoke detectors.
11. Introduce on system each of the alarm conditions that system is required to detect. Verify proper receipt and proper processing of signal at Control Panel and correct activation of control points.
12. Consult manufacturer's manual to determine proper testing procedures when system is equipped with optional features. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality, and similar.

C. Acceptance Testing:

1. The contractor's job foreman and an assistant, in the presence of a representative of the manufacturer, an assigned representative of Central Unified School District, and the assigned inspector of the AHJ, shall perform a test of the system. All attending personnel shall be given reasonable notice so as to make themselves available for the test.
2. Operate every installed device to verify proper operation and correct annunciation at the control panel.
2. Open signaling line circuits and notification appliance circuits in at least 2 locations to verify presence of supervision.
3. Completely disconnect main Control Panel from rest of network. Activate initiating device. All control outputs supported by transponder SLC circuits shall operate under project programming mode. Default or degrade mode programming shall not be acceptable.
4. Complete any additional testing required by the AHJ.
5. When testing has been completed to satisfaction of both Contractor's job foreman, representatives of the manufacturer and Owner, and the inspector of the AHJ, a notarized letter co-signed by each attesting to satisfactory completion of said testing shall be forwarded to the Owner and fire department.
6. Leave fire alarm system in proper working order and, without additional expense to Owner, replace defective materials and equipment provided within 1 year (365 days) from date of final acceptance by the owner.

3.05 DEMONSTRATION

- A. Provide 4-hour's instruction class to the district's designated personnel for operating the fire alarm system.

- B. Provide hands-on demonstrations of operation of fire alarm system components and functions.

END OF SECTION