



## **Project Manual**

for the

# **Alterations to Building A University ES @ La Fiesta HVAC Replacement**

**July 18, 2023**

**DSA File Number: 49-17  
DSA Application Number:  
PTN Number: 73882-47**

**Owner:**

Cotati-Rohnert Park Unified School District  
7165 Burton Avenue  
Rohnert Park, CA 94928

**Architect:**

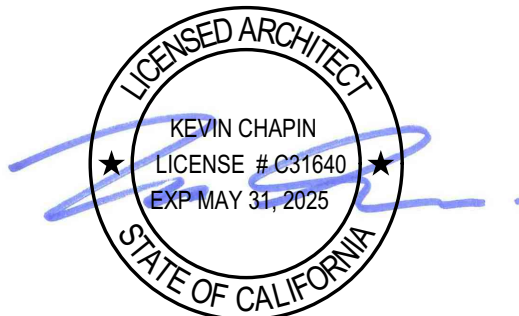
Quattrocchi Kwok Architects  
636 Fifth Street  
Santa Rosa, CA 95404  
P: 707.576.0829  
F: 707.576.0295

**Architect's Project No.: 2173.00**

DOCUMENT 00 0107

**PROFESSIONAL SEALS AND DSA IDENTIFICATION STAMP**

**DIVISION OF THE STATE ARCHITECT IDENTIFICATION STAMP**



Date: 07/18/2023

**Architect**

**QUATTROCCHI KWOK ARCHITECTS**

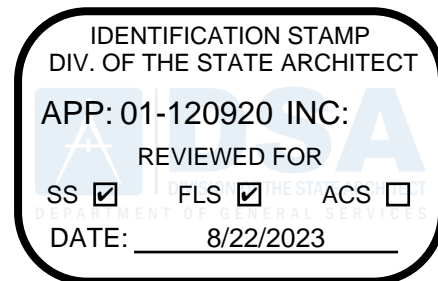
636 Fifth Street

Santa Rosa, CA 95404

P: 707-576-0829

Kevin Chapin

Lic: C 31640





07/18/2023

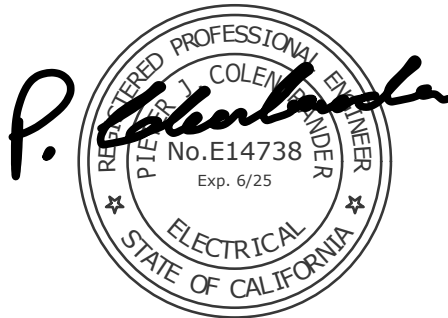
**Structural Engineer**  
ZFA

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Santa Rosa, CA 95404  
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Chris Warner  
Lic: S4613



**Mechanical Engineer**  
COSTA ENGINEERS

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Pieter Colenbrander  
Lic: E14738

END OF SECTION

DOCUMENT 00 0110

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# **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

## **University Elementary School at La Fiesta**

**BID No. 23-020**

**BID AND CONTRACT DOCUMENTS**

**Bid Packages Due on or Before:**

**February 1, 2024 – 2:00 p.m.**



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# **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

## **University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 1  
NOTICE TO BIDDERS**

**00 11 33**  
**NOTICE TO BIDDERS**

NOTICE IS HEREBY GIVEN that the Cotati-Rohnert Park Unified School District (“District”) will receive bids up to, but not later than **02:00 p.m. on February 1, 2024**, sealed bids for the award of a contract for:

**BID NO. 23-020**

**University Elementary at La Fiesta  
Building A Re-Roof and HVAC**

Bids shall be received at COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT 7165 Burton Avenue, and shall be opened and publicly read aloud at the above state time and place. Responses must be sealed and clearly marked **“University Elementary School Building A Re-Roof and HVAC, BID NO. 23-020.”** Facsimile or electronic copies of the bid will not be accepted. Bids received after the above-specified time may be rejected.

The Project includes modernization of mechanical systems to classroom building A; includes, replacement of the HVAC System, Cover open Mechanical well to match existing building roof line and new fire alarm system. There will be a **mandatory** Pre-Bid Conference at the 8511 Liman Way, Rohnert, CA 94928, on **January 4<sup>th</sup>, 2024 at 3:00 p.m.** for the purpose of acquainting all prospective bidders with the bid documents and the work site. Please notify Josh Savage; [josh\\_savage@crpusd.org](mailto:josh_savage@crpusd.org). Failure to attend this mandatory pre-bid conference may disqualify the non-attending bidder from the bid.

Each bid must conform and be responsive to this notice and all other documents comprising the contract documents. All interested parties may obtain additional information by contacting Josh Savage; [josh\\_savage@crpusd.org](mailto:josh_savage@crpusd.org).

All forms must be completed, signed, and returned with the bid. No bidder may withdraw its bid for a period of sixty (60) calendar days after the date set for the receipt of bids. The successful bidder shall file a payment bond issued by an admitted Surety authorized to conduct business in the State of California approved by the District. A performance bond will also be required.

This Project is a public works project and is subject to the payment of prevailing wages. The Director of Industrial Relations has determined the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the contract that will be awarded to the successful bidder, copies of which are available to the public on the internet at <http://www.dir.ca.gov/DLSR/> or from the District Purchasing Department, upon request.

The successful bidder and all subcontractor(s) shall comply with all applicable Labor Code provisions, which include, but are not limited to, the payment of not less than the required prevailing rates to all workers employed by them in the execution of the Contract, the employment of apprentices, the hours of labor and the debarment of contractors and subcontractors.

Each Bidder submitting a bid must be a Department of Industrial Relations registered contractor pursuant to Labor Code section 1725.5 (“DIR Registered Contractor”), unless an exception expressly provided in the Labor Code applies. This project is subject to compliance monitoring and enforcement by the DIR. If awarded the Contract, at all times during performance of the work, the Bidder and all Subcontractors of any tier shall be DIR Registered Contractors and continue to comply with all DIR requirements.

This Contract is subject to prequalification pursuant to Public Contract Code section 20111.6.

Disabled Veteran Contractors are encouraged to submit bids. This bid is subject to Disabled Veteran Business Enterprise requirements.

Each bidder shall be a licensed contractor pursuant to the Business and Professions Code and shall be licensed in the

following classifications: B No bid will be accepted from a contractor who has not been licensed in accordance with the California Business and Profession Code at the time the bid is submitted.

**The District reserves the right to reject any or all bids, to accept or reject any one or more items of a bid, or to waive any irregularities or informalities in the bid or in the bidding process.**

*Date:* December 5, 2023

Publication Dates: December 9, 2023 and December 16, 2023

# **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

## **University Elementary at La Fiesta Re-Roof and HVAC**

**BID No. 23-020**

**SECTION 2  
INSTRUCTIONS  
TO BIDDERS**

**00 21 13**  
**INSTRUCTIONS TO BIDDERS**

**1. Preparation and Availability of Bid Form; Deadline for Receipt of Bids**

Each bid on the attached form shall be sealed and submitted to the District at such time and place as is stated in the Notice Inviting Bids, not later than **2:00 p.m. on February 1, 2024**. The District suggests that bids be hand delivered in order to ensure their timely receipt. Any bids received after the time stated, regardless of the reason, shall be returned, unopened, to the bidder. The District will not accept any bids or bid modifications submitted by facsimile or electronic mail transmission.

Bids shall only be prepared using the copy of the Bid Form, which is included and part of the Contract Documents for the Project. The use of substitute bid forms other than clear and correct photocopies of those provided by the District will not be permitted. Bids shall be received by Josh Savage; [josh\\_savage@crpusd.org](mailto:josh_savage@crpusd.org)

All blanks in the bid form must be appropriately filled in, and all prices must be stated in both words and figures. All items on the form shall be filled out in ink. Numbers should be stated in figures, and the signatures of all individuals must be in long hand. The completed form should be without interlineations, alterations, or erasures. If a different price is stated in words than is stated in figures, the price stated in words shall be the price bid.

The District may receive requests for the Contract Documents from plan rooms. Please note: Prospective Bidders who choose to review the Contract Documents at a plan room must contact the District to obtain the required Contract Documents and register for participation if they decide to submit a Bid for the Project.

**QUESTIONS CONCERNING BID DOCUMENTS:** Any questions pertaining to the bid documents are to be directed via e-mail only to the District's **Josh Savage Executive Director of Facilities, Maintenance and Operations** at [josh\\_savage@crpusd.org](mailto:josh_savage@crpusd.org). Questions must be received before **3:00 p.m. on January 19<sup>th</sup>, 2024**, questions received after this time will NOT be addressed.

Any clarification the District deems necessary as a result of questions received or to further clarify the bid documentation will be done via an addendum and shall be distributed to all firms participating in this opportunity who are known to have received a copy of the bid documents. Vendors shall contact the District to ensure they have receive all addenda issued.

**2. Execution of Forms**

Each bid shall give the full business address of the bidder and must be signed by the bidder or bidder's authorized representative with his or her usual signature. Bids by partnerships must furnish the full names of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters. Bids by corporations must be signed with the legal name of the corporation, followed by the signature and designation of the president, secretary, or other person authorized to bind the corporation in this matter. The name of each person signing shall also be typed or printed below the signature. When requested by the District, satisfactory evidence of the authority of the officer signing on behalf of the corporation or partnership shall be furnished. A bidder's failure to properly sign required forms may result in rejection of the bid. All bids must include the bidder's contractor license number(s) and expiration date(s).

**3. Bidders' Conference**

A bidders' conference will be held on January 4, 2024, at 3:00PM, for the purpose of acquainting all prospective bidders with the Contract Documents and the Project site. The failure to attend the conference may result in the disqualification of the bid of the non-attending bidder.

#### **4. Requests for Information**

A bidder's failure to request clarification or interpretation of an apparent error, inconsistency or ambiguity in the Contract Documents waives that bidder's right to thereafter claim entitlement to additional compensation based upon an ambiguity, inconsistency, or error, which should have been discovered by a reasonably prudent Contractor, subject only to the limitations of Public Contract Code § 1104. To the fullest extent permitted by law District expressly disclaims responsibility for assumptions a bidder may draw from the presence or absence of information in the bid documents. Any questions relative to the bid shall be in writing and directed to Josh Savage; josh\_savage@crpusd.org These requests shall be submitted to the District at least seven working days prior to the date the bid is due.

#### **5. Bid Security**

Bid proposals shall be accompanied by a certified or cashier's check or bid bond for an amount not less than ten percent (10%) of the bid amount, payable to the District. A bid bond shall be secured from an admitted surety company, licensed in the State of California, and satisfactory to the District. The bid security shall be given as a guarantee that the bidder will enter into the Contract if awarded the work, and in the case of refusal or failure to enter into the Contract within ten (10) calendar days after notification of the award of the Contract or failure to provide the payment and performance bonds and proof of insurance as required by the Contract Documents, the District shall have the right to award the Contract to another bidder and declare the bid security forfeited. The District reserves the right to pursue all other remedies in law or equity relating to such a breach including, but not limited to, seeking recovery of damages for breach of contract. Failure to provide bid security, or bid security in the proper amount, may result in rejection of the bid.

#### **6. Faxed and Electronic Mail Bids**

All bids must be under sealed cover. District will not accept any bids or bid modifications submitted by facsimile or electronic mail transmission.

#### **7. Withdrawal of Bids**

Bid proposals may be withdrawn by the bidders prior to the time fixed for the opening of bids, but may not be withdrawn for a period of sixty (60) days after the opening of bids, except as permitted pursuant to Public Contract Code § 5103.

#### **8. Addenda or Bulletins**

The District reserves the right to issue addenda or bulletins prior to the opening of the bids subject to the limitations of Public Contract Code § 4104.5. Any addenda or bulletins issued prior to bid time shall be considered a part of the Contract Documents.

Please note: Bidders are responsible for ensuring that they have received any and all addenda. To this end, each Bidder should contact the Office of Purchasing to verify that he/she has received all Addenda issued, if any, prior to the bid opening.

#### **9. Agreements and Bonds**

The Agreement form, which the successful Bidder, as Contractor, will be required to execute, and the forms and amounts of surety bonds, which will be required to furnish at the time of execution of the Agreement, are included in the Contract Documents and shall be carefully examined by the Bidder. The required number of executed copies of the Agreement, the Performance Bond, and the Payment Bond is as specified in the Special Conditions.

The successful bidder shall be required to submit payment and performance bonds as specified in and using the

bond forms included with the Contract Documents. All required bonds shall be based on the maximum total contract price as awarded, including additive alternates, if applicable. The Performance Bond must be executed by an admitted surety insurer approved to conduct business in the State of California which meets the highest standards the District is legally permitted to establish and which it has established. The District reserves the right to approve or reject the surety insurer selected by the Contractor and to require the Contractor to obtain a bond from a surety satisfactory to the District. Bonds shall be in the form set forth in the Contract Documents.

#### **10. Signing of Bids**

All Bids submitted shall be executed by the Bidder or its authorized representative. Bidders may be asked to provide evidence in the form of an authenticated resolution of its Board of Directors or a Power of Attorney evidencing the capacity of the person signing the Bid to bind the Bidder to each Bid and to any Contract arising therefrom.

If a Bidder is a joint venture or partnership, it may be asked to submit an authenticated Power of Attorney executed by each joint venturer or partner appointing and designating one of the joint venturers or partners as a management sponsor to execute the Bid on behalf of Bidder. Only that joint venturer or partner shall execute the Bid. The Power of Attorney shall also: (1) authorize that particular joint venturer or partner to act for and bind Bidder in all matters relating to the Bid; and (2) provide that each venturer or partner shall be jointly and severally liable for any and all of the duties and obligations of Bidder assumed under the Bid and under any Contract arising therefrom. The Bid shall be executed by the designated joint venturer or partner on behalf of the joint venture or partnership in its legal name.

#### **11. Award of Contract and Rejection of Bids**

The Contract shall be awarded to the lowest responsible and responsive bidder as interpreted by the District under California law and the Contract Documents, including the Notice to Bidders and these Instructions. The District reserves the right, without any liability, to cancel the award of any bid for any reason at any time before the full execution of the Agreement between District and Contractor.

The District may reject any bid which, in its opinion when compared to other bids received or to the District's internal estimates, does not accurately reflect the cost to perform the Work. The District may reject as non-responsive any bid which unevenly weights or allocates costs, including but not limited to overhead and profit to one or more particular bid items.

**The District reserves the right to reject any or all bids, or to waive any irregularities or informalities in any bid or in the bidding process.**

#### **12. Execution of Contract**

The successful bidder shall, within ten (10) calendar days of the Notice of Intent to Award of the Contract, sign and deliver to the District the executed contract along with the bonds and certificates of insurance required by the Contract Documents. In the event the successful bidder fails or refuses to execute the Contract or fails to provide the bonds and certificates as required, the District may declare the bidder's bid deposit or bond forfeited as liquidated damages, and may award the work to the next lowest responsible, responsive bidder, or may reject all bids and, in its sole discretion, call for new bids. In all cases, the District reserves the right, without any liability, to cancel the award of Contract at any time prior to the full execution of the Contract.

#### **13. Modifications**

Each Bidder shall submit its Bid in strict conformity with the requirements of the Contract Documents. Unauthorized additions, modifications, revisions, conditions, limitations, exclusions or provisions attached to a Bid may render it non-responsive and may cause its rejection. Bidders shall neither delete, modify, nor supplement the printed matter on the Bid Forms, nor make substitutions thereon. Oral, telephonic and electronic modifications will



not be considered, unless the Notice to Bidders authorizes the submission of electronic bids and modifications thereto and such modifications are made in accordance with the Notice to Bidders.

#### **14. Erasures/Mutilation of Bid Documents**

The Bid submitted must not contain any erasures, interlineations, or other corrections unless each such correction is suitably authenticated by affixing in the margin immediately opposite the correction the surname or surnames of the person or persons signing the bid.

Contractors should not deface or mutilate the bid documents to the extent that they may not be usable for construction purposes. Bid documents obtained under deposit shall be returned within ten (10) days after bid opening.

#### **15. Examination of Site and Contract Documents**

Each Bidder shall visit the site(s) of the proposed work and fully acquaint itself with the conditions relating to the construction and labor so that it may fully understand the facilities, difficulties, and restrictions attending the execution of the work under the Contract. Bidders shall thoroughly examine and be familiar with the Drawings and Specifications. All Drawings, Specifications and other documents used or prepared during the project shall be the exclusive property of the District. The failure or omission of any Bidder to receive or examine any Contract Documents, forms, instruments, addenda, or other documents or to visit the site(s) and acquaint itself with conditions there existing shall in no way relieve any Bidder from obligations with respect to its bid or to the Contract. The Bidder is responsible to obtain any geotechnical and/or soils report pertaining to the site of the work at Bidder's expense, if applicable. Although any such report does not operate as a warranty or guarantee of site conditions, the submission of a Bid shall be taken as prima facie evidence of compliance with all terms of this section.

Discrepancies in, and/or omissions from the Plans, Specifications or other Contract Documents or questions as to their meaning shall be immediately brought to the attention of the District by submission of a written request for an interpretation or correction to the District. Such submission, if any, must be sent to Josh Savage; [josh\\_savage@crpusd.org](mailto:josh_savage@crpusd.org) Any interpretation of the Contract Documents will be made only by written addenda duly issued and mailed or delivered to each person or firm who has obtained a set of Contract Documents directly from the District. The District will not be responsible for any explanations or interpretations provided in any other manner. No person is authorized to make any oral interpretation of any provision in the Contract Documents to any Bidder, and no Bidder should rely on any such oral interpretation.

Bids shall include complete compensation for all items that are noted in the Contract Documents as the responsibility of the Contractor.

- (a) Each Bidder, by making its bid, represents that it has read and understands the Contract and Contract Documents and any and all related reports and information. After executing the Agreement, no consideration will be given to any claim of misunderstanding of the documents.
- (b) Each Bidder, by making its bid, represents that it has visited the site(s), inspected the area of the work, and familiarized itself with the local conditions under which the work is to be performed, including sub-surface conditions, as appropriate. Such inspection shall specifically consider requirements for accessing the site and determining the work can be completed as required by, and as shown in, the Contract Documents.
- (c) No bidder shall visit the site without prior authorization of the District. Bidders shall contact Josh Savage; [josh\\_savage@crpusd.org](mailto:josh_savage@crpusd.org) for site visits.

#### **16. Sales and Other Applicable Taxes, Permits, and Fees**

Contractor and its subcontractors performing work under this Contract will be required to pay California sales tax and other applicable taxes, and to pay for permits, licenses and fees required by the agencies with authority in the jurisdiction in which the work will be located, unless otherwise expressly provided by the Contract Documents.

**17. 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, the Bidder's construction experience in the type of work being required by the District, and the Bidder's organization available for the performance of the Contract and any other required evidence of the Bidder's qualifications to perform the Contract. The District may consider such evidence before making its decision awarding the Contract. Failure to submit requested evidence of a Bidder's responsibility to perform the Contract may result in rejection of the Bid.

**18. Bid Exceptions**

Bid exceptions are not allowed. If the Bidder has a comment regarding the bid documents or the scope of work, the Bidder shall submit those comments to the District for evaluation at least five (5) working days prior to the opening of the bids. No oral or telephonic modification of any bid submitted will be considered and a sealed written modification may be considered only if received prior to the opening of bids. Emailed or faxed bids or modifications will not be accepted.

**19. Discounts**

Any discounts which the bidder desires to provide the District must be stated clearly on the bid form itself so that the District can calculate the net cost of the bid proposal. Offers of discounts or additional services not delineated on the bid form will not be considered by the District in the determination of the lowest responsible responsive bidder.

**20. Quantities**

The quantities shown on the plans and specifications are approximate. The District reserves the right to increase or decrease quantities as desired.

**21. Prices; Containers Costs and Delivery**

Bidders must quote prices F.O.B. unless otherwise noted. Prices should be stated in the units specified and bidders should quote each item separately. All costs for containers shall be borne by the bidder. All products shall conform to the provisions set forth in the federal, county, state and city laws for their production, handling, processing and labeling. Packages shall be so constructed to ensure safe transportation to the point of delivery.

**22. Samples**

On request, samples of the products being bid shall be furnished to the District.

**23. Substitutions**

In describing any item, the use of a manufacturer or brand does not restrict bidding to that manufacturer or brand, but is intended only to indicate quality and type of item desired, except as provided in Public Contract Code § 3400. Substitute products may be considered either prior to or after the award of the Contract in accordance with § 3400 and as set forth in either the Special Conditions or the Specifications. All data substantiating the proposed substitute as an "equal" item shall be submitted with the written request for substitution. The District reserves the right to make all final decisions on product and vendor selection.

IF A PROPOSED SUBSTITUTION IS REJECTED, BIDDER SHALL BE RESPONSIBLE FOR PROVIDING THE ITEM OR PRODUCT OR WORK AS ORIGINALLY SPECIFIED AT NO ADDITIONAL COST TO THE DISTRICT. THE DISTRICT HAS THE COMPLETE AND SOLE DISCRETION TO DETERMINE IF AN ITEM OR ARTICLE IS AN EQUAL ITEM.

**24. Bid Negotiations**

A bid response to any specific item of the bid using terms such as “negotiable,” “will negotiate,” or similar phrases, will be considered non-responsive.

**25. Prevailing Law**

In the event of any conflict or ambiguity between these instructions and state or federal law or regulations, the latter shall prevail. All equipment to be supplied or services to be performed under the bid proposal shall conform to all applicable requirements of local, state and federal law, including, but not limited to, Labor Code §§ 1771, 1778 and 1779.

**26. Allowances**

An “allowance” means an amount included in the bid proposal for work that may or may not be included in the Project, depending on conditions that will become known only after the Project is underway.

**27. Bidders Interested in More Than One Bid and Bidders Not Qualified to Bid**

No person, firm, or corporation shall be allowed to make, or file, or be interested in more than one bid for the same work unless alternate bids are specifically called for. A person, firm, or corporation that has submitted a sub-proposal to a Bidder, or that has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or making a prime proposal. No person, firm, or corporation shall be allowed to bid who has participated in the preparation of contract specifications; a bid by such a person, firm, or corporation shall be determined to be nonresponsive.

**28. Additive and Deductive Items – Method of Determining Basis of Award**

Pursuant to Public Contract Code §20103.8, should this bid solicitation include additive and/or deductive items, the checked  method shall be used to determine the lowest bid:

(a) The lowest bid shall be the lowest bid price on the each respective base bid section contract without consideration of the prices on the additive or deductive items.

(b) The lowest bid shall be the lowest total of the bid prices on the base contract and those additive or deductive items that were specifically identified in the bid solicitation as being used for the purpose of determining the lowest bid price.

(c) The lowest bid shall be the lowest total of the bid prices on the base contract and those additive or deductive items taken in order from a specifically identified list of those items that, when in the bid form and added to, or subtracted from, the base contract, are less than, or equal to, a funding amount publicly disclosed by the District before the first bid is opened.

(d) The lowest bid shall be determined in a manner that prevents any information that would identify any of the Bidders from being revealed to the public entity before the ranking of all Bidders from lowest to highest has been determined.

If no method is checked, sub-paragraph (a) shall be used to determine the lowest bid.

Notwithstanding the method used by the District to determine the lowest responsible Bidder, the District retains the right to add to or deduct from the Contract any of the additive or deductive items included in the bid solicitation.

**29. Listing Subcontractors**

Pursuant to the Subletting and Subcontracting Fair Practices Act, Public Contract Code §§ 4100 et seq., every bidder shall, on the enclosed Subcontractor List Form, set forth:

- (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 bidder in or about the work or fabricate and install work in an amount in excess of one-half of the one percent (0.5%) of the bidder's total bid.
- (b) If the bidder fails to specify a Subcontractor for any portion of the work to be performed under the Contract in excess of one-half of one percent (0.5%) of the bidder's total bid, bidder agrees that bidder is fully qualified to and shall perform that portion of the work. The successful bidder shall not, without the written consent of the District or compliance with Public Contract Code §§ 4100 et seq., either:
  - 1) Substitute any person as Subcontractor in place of the Subcontractor designated in the original bid;
  - 2) Permit any subcontract to be voluntarily assigned or transferred or allow the work to be performed by anyone other than the original Subcontractor listed in the bid; or
  - 3) Sublet or subcontract any portion of the work in excess of one-half of one percent (0.5%) of the total bid as to which the bidder's original bid did not designate a Subcontractor.

**30. Form and Approval of Contract**

The Contract Documents must be approved by the Board of Education of the District. The bidder selected by the District shall execute the contract provided by the District.

**31. Denial of Right to Bid**

Contractors or Subcontractors who have violated state law governing public works shall be denied the right to bid on this public works contract pursuant to Labor Code § 1777.7.

**32. Contractor's State License Board and Certifications**

Contractors and Subcontractors are required by law to be licensed and regulated by the California Contractors' License Board. Pursuant to Section 7028.15 of the Business and Professions Code and Section 3300 of the Public Contract Code, all Bidders must possess proper licenses for performance of this Contract prior to submittal of bid documents. Subcontractors must possess the appropriate licenses for each specialty subcontracted prior to submittal of bid documents. Pursuant to Section 7028.5 of the Business and Professions Code, the District shall consider any bid submitted by a contractor not currently licensed in accordance with state law and pursuant to the requirements found in the Contract Documents to be non-responsive, and the District shall reject the Bid. The District shall have the right to request, and Bidders shall provide within five (5) calendar days, evidence satisfactory to the District of all valid license(s) currently held by that Bidder and each of the Bidder's subcontractors, before awarding the Contract.

Bidder must have all certifications and/or factory authorizations required for the project prior to submittal of the Bid including, but not limited to, the specified manufacturer certifications described in the Special Conditions section of this document. Subcontractors must have all certifications and/or factory authorizations required for each specialty subcontract prior to submittal of the Bid including, but not limited to, the specified manufacturer

certifications described in the Special Conditions section of this document.

### **33. Fingerprinting**

By law it is the District's responsibility to determine whether a contractor must provide fingerprint certification. Pursuant to Education Code § 45125.2, the District considers the totality of the circumstances in order to determine if fingerprinting of employees of a contractor working on a school site is required. Factors to be considered include the length of time the contractor's employees are on school grounds, whether students are in proximity to the location where the contractor's employees are working, and whether the contractor's employees are working alone or with others.

### **34. Labor Compliance Monitoring**

The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with Labor Code § 1771.1, all bidders, contractors and subcontractors working at the site shall be duly registered with the Department of Industrial Relations at time of bid opening and at all relevant times. Proof of registration shall be provided as to all such contractors prior to the commencement of any work.

### **35. Retention**

The Project is not considered substantially complex and therefore requires a standard retention amount of 5%.

### **36. Disabled Veteran Business Enterprises**

Compliance with Disabled Veteran Business Enterprise ("DVBE") contracting goals **is** required for this project. Although, minority, women and disabled veteran contractors are encouraged to submit bids.

### **37. Bid Protests**

A bidder may protest the bidding process for the project only by filing a written protest with the **Josh Savage, e.g. Executive Director of Facilities, Maintenance and Operations**, in accordance with the procedures set forth in this section. The District will not consider any verbal protests (e.g., by telephone) or any protests sent by electronic mail. In order for a protest to be valid and considered by the District, the protest must: (a) be filed not later than seventy-two (72) hours after the end of the bid opening; (b) clearly identify the bidder on whose behalf the protest is being filed, together with the name, address and telephone number of the person representing the bidder for purposes of the protest; (c) clearly identify the specific bidding process, bid or award of the Contract being protested; (d) clearly identify and describe in detail the specific basis or bases for the protest and all facts relevant thereto and in support thereof; (e) clearly identify all references to the specific portions of all documents relevant to the protest; (f) clearly identify and describe in detail all arguments in support of the protest, including, without limitation, any citations to all legal authorities; and (g) be submitted with all documentation that is relevant to and supports the basis or bases underlying the protest.

If a protest filed by a Bidder does not comply with each and every one of the foregoing requirements, the District may reject the protest as invalid. If a Bidder files a valid protest, the District shall review the protest and all relevant information and documents and will provide written decision to the protesting bidder. In response to a protest, the District may decline to award a contract, may award a contract to a bidder other than as previously intended, or may award a contract to a bidder as previously intended despite the protest. Such action by the District shall be a condition precedent to the filing of any claim or demand and to the initiation of any action (legal or equitable) or other proceeding arising from the matter(s) protested.

**COMPLIANCE WITH THE FOREGOING REQUIREMENTS IS MANDATORY.** Each bidder that desires to protest must file a protest in accordance with the foregoing requirements, and no bidder may rely on a protest by another bidder as a means of satisfying such requirements. Compliance with the foregoing requirements is the sole

and exclusive means of protesting the bidding process, any bid, and/or the intended award of a contract for the project, and failure to so comply shall be deemed and construed as a waiver of any and all rights the Bidder may have to pursue a claim, demand or action based on the bidding, any bids, and/or any contract awarded for the Project.

**38. Ethics in Bidding**

The District expects the Bidders to maintain high ethical standards in engaging in the competitive bidding process. The bid amount of one Bidder should not be divulged to another before the award of the subcontract or order, nor should it be used by Contractor to secure a lower proposal from another Bidder on that project (bid shopping). Subcontractors or suppliers should not request information from the Contractor regarding any sub-bid in order to submit a lower proposal on that project (bid peddling). The District will consider any Bidder found to be engaging in such practices to be a non-responsible Bidder and may reject its bid on that ground.

**39. Insurance Requirements**

The successful Bidder shall procure the insurance in the form and in the amount specified in the Contract Documents.

**40. Debarment of Contractors and Subcontractors**

In accordance with the provisions of the Labor Code, contractors or subcontractors may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Labor Code sections 1777.1 or 1777.7. Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid to a debarred subcontractor by the Contractor for the Project shall be returned to the District. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the Project.

**41. Public Records**

All documents included in the bids become the exclusive property of the District upon submittal to the District. All Bids and other documents submitted in response to the Notice to Contractors Calling for Bids become a matter of public record, except for information contained in such bids deemed to be trade secrets, as defined in California Civil Code Section 3426.1. A Bidder that indiscriminately marks all or most of its Bid as exempt from disclosure as a public record, whether by the notations of "Trade Secret," "Confidential," "Proprietary," or otherwise, may render the Bid non-responsive and rejected. The District is not liable or responsible for the disclosure of such records, including those exempt from disclosure if disclosure is deemed required by law by an order of court, or which occurs through inadvertence, mistake or negligence on the part of the District or its officers, employees or agents. At such time as Bids are deemed a matter of public record, pursuant to the above, any Bidder or other party shall be afforded access for inspection and/or copying of such bids, by request made to the District in conformity with the California Public Records Act, Government Code § 6250 et seq.

**42. Prequalification**

**PREQUALIFICATION:**

This Contract is subject to prequalification. If a bidder is not prequalified to bid on the Contract, Owner will not accept the bid. Any subcontractors listed by the bidder for Work requiring C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, or C-46 licenses must have current prequalified status with the Owner. The application for prequalification must be submitted to the Owner by the date specified in the application. The prequalification application may be obtained from the Owner.

[END OF INSTRUCTIONS TO BIDDERS]



**COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 3  
BID FORMS**



**00 42 00**  
**BID FORM AND PROPOSAL**

To: Governing Board of Education of the Cotati-Rohnert Park Unified School District ("District")

From: \_\_\_\_\_

(Insert Proper Name of Bidder)

The undersigned declares that the Contract Documents including, without limitation, the Notice to Bidders and the Instructions to Bidders have been read and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications of the **University Elementary at La Fiesta Re-Roof and HVAC, Bid No. 23-020** ("Project") and will accept in full payment for that Work the following total lump sum amount, all taxes included:

A. \_\_\_\_\_ Dollars                    \$ \_\_\_\_\_  
Base Bid

B. \_\_\_\_\_ Dollars                    \$ \_\_\_\_\_  
10% Owner's Contingency

The Owner's Contingency of ten percent (10%) shall only be allocated for items relating to the Work that could not reasonably have been foreseen at the time of bid. Contractor shall not bill for or be due any portion of this allowance unless the District has identified specific work, Contractor has submitted a price for that work or the District has proposed a price for that work, the District has accepted the cost for that work, and the District has authorized Contractor's use of the Owner's Contingency. Contractor hereby authorizes the District to execute a unilateral deductive change order at or near the end of the Project for all or any portion of the allowance not allocated.

C. Ten Thousand Dollars                    \$10,000.00  
Allowance 1 – Dry Rot Repair

D. \_\_\_\_\_ Dollars                    \$ \_\_\_\_\_  
TOTAL BID

The undersigned has checked carefully all the above figures and understands that the District is not responsible for any errors or omissions on the part of the undersigned in making this bid.

Enclosed find certified or cashier's check no. \_\_\_\_\_ of the \_\_\_\_\_ Bank for \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) or Bidder's Bond of the \_\_\_\_\_ surety company in an amount of not less than ten percent (10%) of the entire bid. The undersigned further agrees, on the acceptance of this proposal, to execute the Contract, provide the required bonds and insurance, and that, in case of default in executing these documents within the time fixed by the Contract Documents, the proceeds of the check or bond accompanying this bid shall be forfeited and shall become the property of

the District.

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

1. Contractor agrees to commence and complete the work within the time specified in the Notice to Proceed. It is understood that this bid is based upon completing the work within the number of calendar days specified in the Contract Documents.
2. The liquidated damages clause of the General Conditions and Special Conditions is hereby acknowledged.
3. The following documents are attached hereto:

Bid Bond on the District's form or other security  
Designated Subcontractors List  
Non-Collusion Affidavit  
Project Warranty

4. Receipt and acceptance of the following Addenda is hereby acknowledged:

Addendum No. 1 \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. 2 \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. 3 \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. 4 \_\_\_\_\_ Dated: \_\_\_\_\_

Addendum No. 5 \_\_\_\_\_ Dated: \_\_\_\_\_

5. Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.
6. The undersigned Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

Furthermore, Bidder hereby certifies to the District that all representations, certifications, and statements made by Bidder, as set forth in this bid form, are true and correct and are made under penalty of perjury.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 202\_

Name of Bidder \_\_\_\_\_

Type of Organization \_\_\_\_\_

Signature \_\_\_\_\_

Signed by \_\_\_\_\_

Title of Signer \_\_\_\_\_

Address of Bidder \_\_\_\_\_

Bidder's Taxpayer Identification No. \_\_\_\_\_

Telephone Number \_\_\_\_\_

Fax Number \_\_\_\_\_

E-mail \_\_\_\_\_ Website \_\_\_\_\_

Contractor's License No(s): No.: \_\_\_\_\_ Class: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

No.: \_\_\_\_\_ Class: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

No.: \_\_\_\_\_ Class: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

If Bidder is a corporation, affix corporate seal.

Name of Corporation: \_\_\_\_\_

President: \_\_\_\_\_

Secretary: \_\_\_\_\_

Treasurer: \_\_\_\_\_

Manager: \_\_\_\_\_

**00 61 10**  
**BID BOND**

WHEREAS, \_\_\_\_\_, as Principal, and \_\_\_\_\_, as Surety, a corporation organized and existing under and by virtue of the laws of the State of \_\_\_\_\_ and authorized to do business as a surety in the State of California, are held and firmly bound unto the Cotati-Rohnert Park Unified School District ("District"), as Obligee, in the sum of \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_), being not less than ten percent (10%) of the Total Bid Price; for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has submitted a bid to the District to perform all Work required for the **University Elementary at La Fiesta Re-Roof and HVAC, Bid No. 23-020** as set forth in the Notice to Bidders and accompanying Contract Documents.

NOW, THEREFORE, if said Principal is awarded a Contract for the Work by the District and, within the time and in the manner required by the above-referenced Contract Documents, enters into the written form of Contract bound with said Contract Documents, furnishes the required bonds (one to guarantee faithful performance and the other to guarantee payment for labor and materials), furnishes the required insurance certificates and endorsements, and furnishes any other certifications as may be required by the Contract, then this obligation shall be null and void; otherwise it shall remain in full 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 notice inviting bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way 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 the Contract of the notice inviting bids, or to the work, or to the specifications.

The bid security will be held by the District for ten (10) days after the period for which bids must be held open or until posting by the successful bidder(s) of the bonds, certificates of insurance required and return of executed copies of the Agreement, whichever first occurs, at which time the bid security will be returned.

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

SIGNED AND SEALED, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature

(SEAL)

(SEAL)

**00 43 36**  
**DESIGNATED SUBCONTRACTORS LIST**

In compliance with the "Subletting and Subcontracting Fair Practices Act," California Public Contract Code sections 4100 to 4114, and any amendments thereto, each Bidder shall provide the information requested below for each subcontractor who will perform work, labor or render service to Bidder in or about the construction of the Work in an amount in excess of one-half of one percent (greater than 0.5 %) of the Bidder's Total Bid Price and shall further set forth the portion of the Work which will be done by each subcontractor. Bidder shall list only one subcontractor for any one portion of the Work.

If the Bidder fails to specify a subcontractor for any portion of the Work to be performed under the Contract, it shall be deemed to have agreed to perform such portion itself, and shall not be permitted to subcontract that portion of the Work except under the conditions hereinafter set forth below.

Subletting or subcontracting of any portion of the Work in excess of one half of one percent (greater than 0.5%) of the Total Bid Price for which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then only after District approval.

**Project**                      **University Elementary at La Fiesta Re-Roof and HVAC, Bid No. 23-020**

**Name of Bidder:** \_\_\_\_\_

**Bidder's  
Authorized Signature:** \_\_\_\_\_

<u>Name and Location of Subcontractor</u>	<u>Description of Work to be Subcontracted</u>
Name: _____	_____
Address: _____	_____
Ph: _____ Fax: _____	License No. _____

~~~~~

|                                               |                                                    |
|-----------------------------------------------|----------------------------------------------------|
| <u>Name and Location<br/>of Subcontractor</u> | <u>Description of Work<br/>to be Subcontracted</u> |
| Name: _____                                   | _____                                              |
| Address: _____                                | _____                                              |
| Ph: _____ Fax: _____                          | License No. _____                                  |

~~~~~

<u>Name and Location of Subcontractor</u>	<u>Description of Work to be Subcontracted</u>
Name: _____	_____
Address: _____	_____
Ph: _____ Fax: _____	License No. _____

~~~~~  
Name and Location  
of Subcontractor

Description of Work  
to be Subcontracted

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

License No. \_\_\_\_\_

~~~~~  
Name and Location  
of Subcontractor

Description of Work  
to be Subcontracted

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

License No. \_\_\_\_\_

~~~~~  
Name and Location  
of Subcontractor

Description of Work  
to be Subcontracted

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

License No. \_\_\_\_\_

~~~~~  
Name and Location  
of Subcontractor

Description of Work  
to be Subcontracted

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

License No. \_\_\_\_\_

~~~~~  
Name and Location  
of Subcontractor

Description of Work  
to be Subcontracted

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

License No. \_\_\_\_\_

~~~~~  
Name and Location  
of Subcontractor

Description of Work  
to be Subcontracted

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

Ph: \_\_\_\_\_ Fax: \_\_\_\_\_

License No. \_\_\_\_\_

**00 45 10**  
**NON-COLLUSION AFFIDAVIT**

In accordance with Public Contract Code section 7106, the undersigned declares that he or she holds the position listed below with the bidder, the party making the foregoing bid, that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that 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, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that 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, or paid, and will not pay, any fee 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.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Typed or Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Bidder

A notary public or other officer 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.
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Subscribed and sworn before me  
This \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

[Seal]

\_\_\_\_\_  
Notary Public in and for  
the State of California



**00 65 36**  
**PROJECT WARRANTY**

We, the undersigned, do hereby warrant and guarantee all products and services described within which we have provided for:

**University Elementary at La Fiesta Re-Roof and HVAC**

**Bid No. 23-020**

are in accordance with the Contract Documents and that all such Work as installed will fulfill or exceed all minimum warranty requirements. We agree to repair or replace Work installed by us for a period of **at least two years** after the date of recording the Notice of Completion, together with any adjacent Work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or function at no expense to the Cotati-Rohnert Park Unified School District, ordinary wear and tear and unusual abuse or neglect excepted. Manufacturers' and suppliers' warranties may be longer than the **two year** period described above, but not shorter.

In the event of our failure to comply with the above-mentioned conditions within seven (7) business days, after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the District to have said defective Work, repaired or replaced to be made good, and agree to pay to the District upon demand all moneys that the District may expend in making good said defective Work, including but not limited to all collection costs and reasonable attorneys' fees.

Company Name: \_\_\_\_\_

Signed: \_\_\_\_\_  
(Contractor's signature)

Name: \_\_\_\_\_  
(printed)

Date: \_\_\_\_\_

# **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

## **University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 4  
AGREEMENT**

**00 52 00**  
**AGREEMENT**

THIS AGREEMENT is made this \_\_\_ day of \_\_\_\_\_ in Sonoma County, State of California, by and between the **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT** (the “District”) and \_\_\_\_\_ (the “Contractor”). The District and Contractor may be referred to herein individually as a “Party” and collectively as the “Parties.”

**RECITALS**

- A. District is contracting for **University Elementary at La Fiesta Re-Roof and HVAC**, Bid No. **23-020** (“Project”).
- B. Contractor has been selected as the lowest responsible and responsive bidder to perform the work The Project includes modernization of mechanical systems to classroom building A; includes, replacement of the HVAC System, Cover open Mechanical well to match existing building roof line and new fire alarm system for the Project.
- C. District desires that the Contractor complete the Project in accordance with the terms and conditions set forth in this Agreement and all Contract Documents incorporated herein.

**NOW, THEREFORE**, in consideration of the mutual agreements and covenants contained in this Agreement, and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

**ARTICLE 1 - SCOPE OF WORK.** The Contractor shall perform within the time stipulated the contract as herein defined, and shall provide all labor, materials, tools, utility services, and transportation to complete in a workmanlike manner all of the work required in connection with the following titled Project:

**University Elementary at La Fiesta Re-Roof and HVAC**  
**Bid No. 23-020**

in strict compliance with the Contract Documents as specified in Article 4 below, which shall be free from any and all liens and claims from mechanics, material suppliers, subcontractors, artisans, machinists, teamsters, freight carriers, and laborers required for the Project.

**ARTICLE 2 - TIME FOR COMPLETION.** The Contractor shall mobilize and commence work on the Project at the direction of District staff. Time is of the essence for this Contract and the Contractor shall complete the Project within the period specified in the Special Conditions and in accordance with the schedule for the Project developed by the District and the Construction Manager, if applicable. Any additional projects will be coordinated between the District and Contractor. In entering into this Agreement, Contractor acknowledges and agrees that the duration stipulated herein is adequate and reasonable for the size and scope of the Project.

**ARTICLE 3 - CONTRACT PRICE.** As full compensation for the Contractor’s complete and satisfactory performance of the work and activities described in the Contract Documents, the District agrees to pay Contractor, and Contractor agrees to accept the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), which shall be paid to the Contractor according to the Contract Documents. Payment and performance bonds are to be issued each in the amount of one hundred percent (100%) of the total amount payment under the Contract. Contractor shall adjust the payment and performance bonds if outstanding work exceeds the original amount of the bonds.

The Contract Price is subject to increases or decreases as provided in the Contract Documents. The District shall pay the Contract Price to the Contractor in accordance with the General Conditions.

**ARTICLE 4 - 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 to Bidders
- Instructions to Bidders
- Bid Form and Proposal, as accepted
- Bid Bond
- Designated Subcontractors List
- Non-Collusion Affidavit
- Project Warranty Agreement
- Performance Bond
- Payment Bond
- General Conditions
- Special Conditions
- Drawings and Specifications
- Notice of Award
- Notice of Proceed
- Workers' Compensation Certification
- Drug-Free Workplace Certification
- Contractor Certification Re Alcoholic Beverage and Tobacco Free Campus Policy
- Contractor Fingerprinting Certification
- Asbestos-Free Materials Certification
- Bidder's Acknowledgement of Project Schedule
- Certificate Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- Iran Contracting Act Certificate
- Escrow Agreement for Security Deposit in Lieu of Retention, if applicable
- Contractor's Certificate Regarding Participation of Disabled Veteran Business Enterprises**
- Addenda Nos. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, as issued

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. This Agreement shall supersede any prior agreement of the Parties.

**ARTICLE 5 – PREVAILING WAGES.** This Project is a public works project subject to prevailing wage requirements and Contractor and its Subcontractors are required to pay all workers employed for the performance of this Contract no less than the applicable prevailing wage rate for each such worker. Contractor acknowledges that the project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations in accordance with Labor Code § 1770 et seq.

**ARTICLE 6 – LIQUIDATED DAMAGES.** Liquidated damages for the Contractor's failure to complete the Contract within the time fixed for Substantial Completion are established in the amount of \$1,250 per calendar day and as further set forth in the Special Conditions.

**ARTICLE 7 – CONTRACTOR'S LICENSE.** The Contractor must possess throughout the Project the legally-required contractor's license classification for this Project, 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. To the extent that there exists any conflicts or inconsistencies between this Agreement and the General Conditions, the provisions contained in the General Conditions shall govern.

**CONTRACTOR:**

**DISTRICT:**

COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT

License No. \_\_\_\_\_

By \_\_\_\_\_  
Maite' Iturri

By \_\_\_\_\_

Title \_\_\_\_\_

Governing Board Date \_\_\_\_\_

(Corporate Seal)

**[END OF DOCUMENT]**

**COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 5  
PERFORMANCE BOND**

**00 61 13**  
**PERFORMANCE BOND**  
**(CALIFORNIA PUBLIC WORK)**

WHEREAS the **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT** (also referred to herein "Obligee") has awarded to \_\_\_\_\_ (hereinafter "Contractor"), a contract for work consisting of but not limited to, furnishing all labor, materials, tools, equipment, services, and incidentals for the **University Elementary at La Fiesta Re-Roof and HVAC Bid No. 23-020** the "Project");

WHEREAS, the Work to be performed by the Contractor is more particularly set forth in that certain Agreement between the Obligee and Contractor dated \_\_\_\_\_, which Agreement and all other contract documents set forth therein (collectively, the "Contract Documents") are incorporated herein and made a part hereof by this reference; and

WHEREAS, the Contractor is required by said Contract Documents furnish a bond ensuring the Contractor's prompt, full and faithful performance of the Work under the Contract Documents ("Bond"),

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, along with our respective heirs, executors, administrators, successors and assigns, jointly and severally, unto the **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT** in the sum of \_\_\_\_\_ dollars, \$\_\_\_\_\_, said sum being not less than 100% of the total amount payable by the said Obligee under the terms of the Contract Documents, in lawful money of the United States, as more particularly set forth herein.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal, his or its heirs, executors, administrators, successors or assigns, promptly, fully and faithfully performs each and all of the obligations and things to be done and performed by the Principal in strict accordance with the terms of the Contract Documents, as they may be modified or amended from time to time, and if the Principal indemnifies and saves harmless the Obligee, its officers, agents and employees from any and all losses, liability and damages, claims, judgments, liens, costs, and fees of every description which may be incurred by the Obligee by reason of the failure or default on the part of the Principal in the performance of any or all of the terms or obligations of the Contract Documents, including all modifications and amendments thereto, and any warranties or guarantees required thereunder, as set forth in the Contract Documents, 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 no change, adjustment of the Contract Time, adjustment of the Contract Price, alterations, deletions, additions, or any other modifications to the terms of the Contract Documents, the Work to be performed thereunder, or to the Specifications or the Drawings shall limit, restrict or otherwise impair Surety's obligations or Obligee's rights hereunder. Surety hereby waives notice from the Obligee of any such changes, adjustments of Contract Time, adjustments of Contract Price, alterations, deletions, additions or other modifications to the Contract Documents, the Work to be performed under the Contract Documents, or the Drawings or the Specifications.

In the event of the Obligee's termination of the Contract due to the Principal's breach or default of the Contract Documents, within twenty (20) days after written notice from the Obligee to the Surety of the Principal's breach or default of the Contract Documents and Obligee's termination of the Contract, the Surety shall notify Obligee in writing of Surety's assumption of obligations hereunder by its election to either remedy the default or breach of the Principal or to take charge of the Work of the Contract Documents and complete the Work at its own expense ("Notice of Election"); provided, however, that the procedure by which the Surety undertakes to discharge its obligations under this Bond shall be subject to the advance written approval of the Obligee, which approval shall not be unreasonably withheld, limited or restricted. The insolvency of the Principal or the Principal's mere denial of a failure of performance or default under the Contract Documents shall not by itself, without the Surety's prompt, diligent inquiry and investigation of such denial, be justification for Surety's failure to give the Notice of Election or for its failure to promptly remedy the failure of performance or default

of the Principal or to complete the Work.

In the event the Surety fails to issue its Notice of Election to Obligee within the time specified herein, the Obligee may take all such action or actions necessary to cure or remedy the Principal's failure of performance or default or to complete the Work. The Principal and the Surety shall be each jointly and severally liable to the Obligee for all damages and costs sustained by the Obligee as a result of the Principal's failure of performance under the Contract Documents or default in its performance of obligations thereunder, including without limitation the costs of cure or completion exceeding the then remaining balance of the Contract Price; provided that the Surety's liability hereunder for the costs of performance, damages and other costs sustained by the Obligee upon the Principal's failure of performance under or default under the Contract Documents shall be limited to the penal sum hereof, which shall be deemed to include the costs or value of any Changes of any Work which increases the Contract Price.

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

In the event that suit or other proceeding is brought upon this Bond by the Obligee, the Surety shall pay to the Obligee all costs, expenses and fees incurred by the Obligee in connection therewith, including without limitation, attorneys' fees.

[Remainder of page intentionally left blank.]



IN WITNESS WHEREOF, we have hereto set our hands and seals this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Principal/Contractor

By: \_\_\_\_\_  
President

\_\_\_\_\_  
Surety

By: \_\_\_\_\_  
Attorney-in-Fact

The rate of premium on this bond is \_\_\_\_\_ per thousand.

The total amount of premium charged, \$\_\_\_\_\_.

(The above must be filled in by corporate surety.)

A notary public or other officer 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                    )  
                                                  )  
County of \_\_\_\_\_                )

On this \_\_\_\_ day of \_\_\_\_\_, in the year \_\_\_\_\_, before me, \_\_\_\_\_, a Notary Public in and for said state, personally appeared \_\_\_\_\_, known to me (or proved to be on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument as the Attorney-in-Fact of the \_\_\_\_\_ (surety) and acknowledged to me that he subscribed the name of the \_\_\_\_\_ (surety) thereto and his own name as Attorney-in-Fact.

\_\_\_\_\_  
Notary Public in and for said State

(SEAL)

My Commission expires \_\_\_\_\_.

**CERTIFICATE AS TO CORPORATE PRINCIPAL**

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_ Secretary of the corporation named as principal to the within bond; that \_\_\_\_\_ who signed the said bond on behalf of the principal was then \_\_\_\_\_ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed and attested for and in behalf of said corporation by authority of its Governing Board.

(Corporate Seal)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

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

[This space intentionally left blank.]

**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 officer 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, \_\_\_\_\_, a Notary Public, personally appeared \_\_\_\_\_, who proved to me 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), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, 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 Surety must be attached hereto.

**COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 6  
PAYMENT BOND**

**00 61 14**  
**PAYMENT BOND**  
**(CALIFORNIA PUBLIC WORK)**

WHEREAS, the **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT** (the "Obligee") has awarded to \_\_\_\_\_ (the "Principal") a contract for the Work commonly described as the: **University Elementary at La Fiesta Re-Roof and HVAC Bid No. 23-020** (the "Project"); and

WHEREAS, the Work to be performed by the Principal is more particularly set forth in that certain Agreement between the Principal and the Obligee, dated \_\_\_\_\_, 20\_\_ which Agreement and all other contract documents set forth therein (collectively, the "Contract Documents") are incorporated herein and made a part hereof by this reference; and

WHEREAS, by the terms of the Contract Documents, and in accordance with California Civil Code §§ 9550 et seq., the Principal is required to furnish a bond for the prompt, full and faithful payment to any Claimant, as hereinafter defined, for all labor, materials or services used, or reasonably required for use, in the performance of the Work on the Project ("Bond"); and

WHEREAS, the term "Claimant" shall refer to any of the persons described in California Civil Code § 9100, who provide or furnish labor, materials or services used or reasonably required for use in the performance of the Work under the Contract Documents, without regard to whether such labor, materials or services were sold, leased or rented.

NOW THEREFORE, we, \_\_\_\_\_, as Principal, and \_\_\_\_\_, as Surety, are held and firmly bound, along with our respective heirs, executors, administrators, successors and assigns, jointly and severally, unto COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT, as Obligee, for payment of the penal sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), said sum being not less than one hundred percent (100%) of the total amount payable by the Obligee under the terms of the Contract Documents, in lawful money of the United States, as more particularly set forth herein.

This Bond shall inure to the benefit of all Claimants so as to give them, or their assigns and successors, a right of action upon this Bond.

The condition of the obligation is such that if the Principal, or its subcontractors, heirs, executors, administrators, successors or assigns fail to pay (1) any Claimant, (2) amounts due under the Unemployment Insurance Code with respect to Work or labor performed on the Project, or (3) amounts required to be deducted, withheld, and paid to the Employment Development Department from the wages of employees of the Principal and its subcontractors under Section 13020 of the Unemployment Insurance Code with respect to the Work and labor, then Surety will pay for the same in an amount not to exceed the sum specified above and, if an action is brought to enforce the liability on the Bond, the Surety shall pay such reasonable attorneys' fees as fixed by the court, as set forth in Civil Code § 9554.

If the Principal promptly, fully and faithfully makes payment to any Claimant for all labor, materials or services used or reasonably required for use in the performance of the Work, then this obligation shall be void; otherwise, it shall be, and remain, in full force and effect.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, deletion, addition, or any other modification to the terms of the Contract Documents, the Work to be performed thereunder, the Specifications or the Drawings, or any other portion of the Contract Documents, shall in any way limit, restrict or otherwise affect its obligations under this Bond; the Surety hereby waives notice from the Obligee of any such change, extension of time, alteration, deletion, addition or other modification to the Contract Documents, the Work to be performed under the Contract Documents, the Drawings or the Specifications of any other portion of the Contract Documents.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ by their duly authorized agents or representatives.

(Corporate Seal)

\_\_\_\_\_  
(Principal Name)

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Typed or Printed Name)

Title: \_\_\_\_\_

(Corporate Seal)

\_\_\_\_\_  
(Surety Name)

By: \_\_\_\_\_  
(Signature of Attorney-in-Fact for Surety)

(Attach Attorney-in-Fact Certificate)

\_\_\_\_\_  
(Typed or Printed Name of Attorney-in-Fact)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Area Code and Telephone Number of 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 officer 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, \_\_\_\_\_, a Notary Public, personally appeared \_\_\_\_\_, who proved to me 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), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, 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.

(SEAL)

\_\_\_\_\_  
Notary Public in and for said State

Commission expires: \_\_\_\_\_

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

**COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID No. 23-020**

**SECTION 7  
GENERAL CONDITIONS**



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**00 72 00**  
**GENERAL CONDITIONS**

**Article 1.      DEFINITIONS**

Addendum: A written change or revision to the Contract Documents issued to the prospective bidders prior to the time of receiving bids.

Alternate: The sum to be added to or deducted from the base Bid if the change in scope of work as described in Alternates is accepted by the District.

Approved: Approved by the District or the District's authorized representative unless otherwise indicated in the Contract Documents.

Architect: The person or firm holding a valid license to practice architecture or engineering which has been designated (if any designated) to provide architectural or engineering design services on this Project. When Architect is referred to within the Contract Documents and no architect or engineer has in fact been designated, then the matter shall be referred to the [Insert appropriate District Staff e.g. Executive Director of Facilities, Maintenance and Operations] or his/her designee.

As Directed: As directed by the District or its Architect, unless otherwise indicated in the Contract Documents.

As Selected: As selected by the District or its Architect, unless otherwise indicated in the Contract Documents.

Bid: The properly completed and signed proposal to perform the construction work for the Project as described in the Contract Documents.

Board of Education: The Board of Education of the District.

Construction Manager: The individual or entity named as such by the District. If no Construction Manager is designated for the Project, all references to the Construction Manager in these Contract Documents shall mean the District and/or its designee.

Contract: The legally binding agreement between the District and the Contractor wherein the Contractor agrees to furnish the labor, materials, equipment, and appurtenances required to perform the work described in the Contract Documents and the District agrees to pay the Contractor for such work.

Contract Documents: The Contract Documents are described in the Contract for this Project.

Contractor: The person or entity holding a valid license in the State of California required for performing this Project and who has contracted with the District to perform the construction work described in the Contract Documents. The term Contractor shall be construed to mean all of the officers, employees, Subcontractors, suppliers, or other persons engaged by the Contractor for the work of this Project.

Day: As used herein shall mean calendar day unless otherwise specifically designated.

District and/or Owner: The District, its Board of Education, authorized officers and employees, and authorized representatives.

DSA: The State of California Division of the State Architect which has the authority to review, approve and inspect

the design, alteration and construction of school buildings.

Final Completion: Final Completion is achieved when the Contractor has fully completed all Contract Document requirements, including, but not limited to, all final punch list items, to the District's satisfaction.

Furnish: Purchase and deliver to the site of installation.

Improvements: The buildings, structures and/or sites that will be constructed, renovated and/or remodeled as part of the Project.

Indicated or As Shown: Shown on drawings and/or as specified.

Inspector: The person engaged by the District to conduct the inspections required by the Education Code and Title 24.

Install: Fix in place, for materials; and fix in place and connect, for equipment.

Modification: An authorized change to the Contract Documents which may or may not include a change in contract price and/or time.

Perform: The Contractor, at Contractor's expense, shall perform all operations necessary to complete the Work, including furnishing of necessary labor, tools, and equipment, and further including the furnishing and installing of materials that are indicated, specified, or required to complete such performance.

Project: The total construction work and activities described in these Contract Documents.

Secure: Obtain.

Subcontractor: A person, firm, or corporation, duly licensed by the State of California, who has a contract with the Contractor to furnish labor, materials and equipment, and/or to install materials and equipment for work in this Contract.

Substantial Completion: Substantial Completion is achieved when the District has the occupation, beneficial use, and enjoyment of the improvement, excluding any final punch list items to be performed by the Contractor at District's direction.

Surety: The person, firm, or corporation, admitted as a California admitted surety that executes as surety the Contractor's Performance Bond and Payment Bond for Public Works.

Work: "Work" of the Contractor or subcontractor includes labor or materials or both.

Miscellaneous terms and phrases:

Where the words "equal," "equivalent," "satisfactory," "directed," "designated," "selected," "as required," and words of similar meaning are used, the written approval, selection, satisfaction, direction, or similar action of the District is required.

Where the word "required" and words of similar meaning are used, it shall mean, "as required to properly complete the work as required by the District," unless stated otherwise.

Where the words “acceptable,” “acceptance,” or words of similar import are used, it shall be understood that the acceptance of the District is intended.

**Article 2.      ARCHITECT**

The Architect is responsible for the overall design of the Project. The working drawings, technical Specifications, sketches and other information necessary to define the work covered by these Contract Documents have been prepared by the Architect. The Architect shall visit, inspect and observe the construction to determine general compliance with the Contract Documents, and interpret the drawings and Specifications consistent with their intent. The Architect shall evaluate the samples and other submittals required in the technical Specifications, and maintain an up-to-date log of all such items processed. The Architect will consult with the District, Contractor, and any state, county or city agency having jurisdiction over the work whenever necessary to further the best interests of the Project.

**Article 3.      DRAWINGS AND SPECIFICATIONS**

- a.      **Contract Documents.** The Contract Documents consist of the executed Contract and all Addenda, all approved change orders, the completed Bid Form, the required Bonds and the Insurance forms, the Notice to Bidders, the Instructions to Bidders, the Notice of Intent to Award, the Notice to Proceed, the General Conditions, the Special Conditions, the drawings and Specifications. Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. The intention of documents is to include all labor and materials, equipment, and transportation necessary for the proper execution of the work. Materials or work described in words which as applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.
  
- b.      **Interpretations.** Drawings and specifications are intended to be fully cooperative and to agree. However, if Contractor observes that drawings and specifications are in conflict, he or she shall promptly notify the District in writing and any necessary changes shall be adjusted as provided in the Contract for changes in work. If such conflict arises, the following order of precedence shall generally apply, provided, however, that the order of precedence shall not be so rigidly interpreted as to affect an absurd or costly result:
  - 1.      Special Conditions shall take precedence over General Conditions.
  - 2.      Technical Specifications implement, in additional detail, the requirements of the General Conditions. In the event of conflict between the Technical Specifications and the General Conditions, the General Conditions shall take precedence.
  - 3.      In the event of a conflict between the Technical Specifications and the drawings, the higher quality, higher quantity and most stringent requirements shall be deemed to apply and shall govern as to materials, workmanship, and installation procedures.
  - 4.      With regard to drawings:
    - (a) Figures govern over scaled dimensions;
    - (b) Larger details govern over general drawings;
    - (c) Addenda/change order drawings govern over contract drawings;
    - (d) Contract drawings govern over standard drawings.
  - 5.      Work not particularly shown or specified shall be the same as similar parts that are shown or specified.
  
- c.      **Ambiguities, Errors and Inconsistencies.** If, in the opinion of the Contractor, the construction details indicated on the drawings or otherwise specified are in conflict with accepted industry standards for quality

construction and therefore might interfere with its full guarantee of the work involved, the Contractor shall promptly bring this information to the attention of the Architect for appropriate action before submittal of the bid. Contractor's failure to request clarification or interpretation of an apparent ambiguity, error or inconsistency waives that Contractor's right to thereafter claim any entitlement to additional compensation based upon an ambiguity, inconsistency, or error, which should have been discovered by a reasonably prudent Contractor, subject to the limitations of Public Contract Code §1104. During the Project, should any discrepancy appear or any misunderstanding arise as to the import of anything contained in the Contract Documents, the matter shall be promptly referred to the Architect (with written notice to the District's Construction Manager), who will issue instructions or corrections. Misunderstanding of drawings and specifications shall be clarified by the District, whose decisions shall be final.

- d. **Lines and Planes.** All lines and planes appearing on Contract drawings to be horizontal or vertical and not explicitly indicated otherwise shall be constructed true and plumb. All lines and planes appearing on Contract drawings to intersect at right angles and not explicitly indicated otherwise shall be constructed at true right angles. Where details are indicated covering specific conditions, such details also apply to all similar conditions not specifically indicated.
- e. **Standards.** 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. The specification standards of the various sections of the Specifications shall be the procedural, performance, and material standards of the applicable association publications identified and shall be the required level of installation, materials, workmanship, and performance for the applicable work. Except where a specific date of issue is mentioned hereinafter, references to specification standards shall mean the edition, including amendments and supplements, in effect on the date of the Notice to Bidders. Where no standard is identified and a manufacturer is specified, the manufacturer's specifications are the standards. All standards shall be subordinate to the requirements of the applicable codes and regulations.
- f. **Reference to the Singular.** Wherever in the Specifications an article, device or piece of equipment is referred to in the singular number, such reference shall include as many such items as are shown on drawings or required to complete the installation.
- g. **Intent of Drawings and Specifications.** It is the intent of the drawings and Specifications to show and describe complete installations. Items shown but not specified, or specified but not shown, shall be included unless specifically omitted.
  - 1. The Specifications shall be deemed to include and require everything necessary and reasonably incidental to the completion of all work described and indicated on the drawings, whether particularly mentioned or shown, or not.
  - 2. Figured dimensions shall be followed in preference to scaled dimensions, and the Contractor shall make all additional measurements necessary for the work and shall be responsible for their accuracy. Before ordering any material or doing any work, the Contractor shall verify all measurements at the Project site and shall be responsible for the correctness of same.

#### **Article 4. TRADE DIVISIONS**

Segregation of the Specifications into the designated trade divisions is only for the purpose of facilitating descriptions and shall not be considered as limiting the work of any subcontract or trade. Subject to other necessary provisions set forth in the Specifications, the terms and conditions of such limitations or inclusions shall lie solely between the Contractor and its Subcontractors. "Scope" as indicated in each section of the Specifications shall serve only as a general guide to what is included in that section. Neither the stated description nor the division of the plans and Specifications to various sections,



which is done solely for convenience, shall be deemed to limit the work required, divide or indicate it by labor jurisdiction or trade practice, or set up any bidding barriers to the various sub-contractors or suppliers.

- a. The Contractor shall be responsible for the proper execution of all work required by the Contract Documents and for allocating such portions as the Contractor sees fit to the various Subcontractors, subject to applicable law. The Contractor is cautioned that the various individual sections may not contain all work that the Contractor may wish to allocate to a particular Subcontractor or everything bearing on the work of a particular trade, some of which may appear in other portions of the plans or Specifications.
- b. If the Contractor elects to enter into any subcontract for any section of the work the Contractor assumes all responsibility for ascertaining that the Subcontractor for the work is competent, licensed, solvent, thoroughly acquainted with all conditions and legal requirements of the work, has included all materials and appurtenances in connection therewith in the subcontract, and has performed its work in strict compliance with the Contract Documents.
- c. It shall be the responsibility of the Contractor to notify each prospective Subcontractor at the time of request for bids of all portions of the Contract Documents, including the General Conditions, special conditions and any parts of sections of Specifications or plans that the Contractor intends to include as part of the subcontract.

**Article 5. MASTER MANDATORY PROVISIONS**

- a. Any material, item, or piece of equipment mentioned, listed or indicated without definition of quality, shall be consistent with the quality of adjacent or related materials, items, or pieces of equipment on the Project.
- b. Any method of installation, finish, or workmanship of an operation called for, without definition of standard of workmanship, shall be followed or performed and finished in accordance with best practices and consistent with adjacent or related installations on the Project.
- c. Any necessary material, item, piece of equipment or operation not called for but reasonably implied as necessary for proper completion of the work shall be furnished, installed or performed and finished; and shall be consistent with adjacent or related materials, items, or pieces of equipment on the Project, and in accordance with best practices.
- d. Names or numbered products are to be used according to the manufacturers' directions or recommendations unless otherwise specified.

**Article 6. COPIES FURNISHED**

Contractor will be furnished, free of charge, copies of drawings and specifications as set forth in Special Conditions. Additional copies may be obtained at cost of reproduction.

**Article 7. OWNERSHIP OF DRAWINGS**

All drawings, specifications, and copies thereof furnished by District are its property. They are not to be used on other work and with exception of signed contract sets, are to be returned to District on request at completion of work.

**Article 8. DETAIL DRAWINGS AND INSTRUCTIONS**

- a. **Examination of Contract Documents.** Before commencing any portion of the Work, Contractor shall again carefully examine all applicable Contract Documents, the Project site and other information given to Contractor as to materials and methods of construction and other Project requirements. Contractor shall

immediately notify the District Representative of any potential error, inconsistency, ambiguity, conflict or lack of detail or explanation. If Contractor performs, permits, or causes the performance of any Work which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction. In no case shall the Contractor or any subcontractor proceed with Work if uncertain as to the applicable requirements.

- b. **Additional Instructions.** After notification of any error, inconsistency, ambiguity, conflict or lack of detail or explanation, the District Representative will provide any required additional instructions, by means of drawings or other written direction, necessary for proper execution of the Work.
- c. **Quality of Parts, Construction and Finish.** All parts of the Work shall be of the best quality of their respective kinds and the Contractor must use all diligence to inform itself fully as to the required construction and finish. In no case shall Contractor proceed with the Work without obtaining first from the District Representative such approval as may be necessary for the proper performance of Work.
- d. **Contractor's Variation from Contract Document Requirements.** If it is found that the Contractor has varied from the requirements of the Contract Documents including the requirement to comply with all applicable laws, ordinances, rules and regulations, including all rules, policies, and regulations of the Cotati-Rohnert Park Unified School District Board of Education, including any rules and regulations related to COVID-19 or other global pandemics, and all federal, state, and local laws, ordinances and regulations, are to be observed strictly by Contractor during the performance of Services pursuant to this Agreement. The District Representative may at any time, before or after completion of the Work, order the improper Work removed, remade or replaced by the Contractor at the Contractor's expense.

**Article 9. CONTRACTOR**

- a. Quality of Work: The Contractor shall perform all the work and activities required by the Contract Documents and furnish all labor, materials, equipment, tools and appurtenances necessary to perform the work and complete it to the District's satisfaction within the time specified. The Contractor shall at all times perform the work of this Contract in a competent and workmanlike manner and, if not specifically stated, accomplish the work according to the best standards of construction practice. 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. Full-Time Superintendent: The Contractor shall employ a full-time competent superintendent and necessary assistants who shall have complete authority to act for the Contractor on all matters pertaining to the work. The superintendent shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable. Also, the superintendent shall not be changed without the written consent of the District unless the superintendent ceases to be employed by the Contractor.
- c. Field Measurements: Contractor shall make the layout of lines and elevations and shall be responsible for the accuracy of both the Contractor's and the Subcontractors' work resulting therefrom. All dimensions affecting proper fabrication and installation of all Contract work must be verified by the Contractor prior to fabrication and installation by taking field measurements of the true conditions. The Contractor shall take, and assist Subcontractors in taking, all field dimensions required in performance of the work, and shall verify all dimensions and conditions on the site. If there are any discrepancies between dimensions in drawings and existing conditions which will affect the work, the Contractor shall promptly bring such discrepancies to the attention of the Architect for adjustment before proceeding with the work. Contractor shall be responsible for the proper fitting of all work and for the coordination of all trades, Subcontractors and persons engaged upon this Contract.

- d. Contractor shall do all cutting, fitting, or patching of Contractor's work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors as shown, or reasonably implied by, the drawings and Specifications for the completed work. Any cost incurred by the District due to defective or ill-timed work shall be borne by the Contractor.

**Article 10. RESPONSIBILITY OF CONTRACTOR**

- a. Contractor shall be held strictly responsible for the proper performance of all work covered by the Contract Documents, including all work performed by Subcontractors. All work performed under this Contract shall comply in every respect to the rules and regulations of all agencies having jurisdiction over the Project or any part thereof.
- b. Contractor shall submit Verified Reports as defined in 24 California Code of Regulations ("CCR") §§ 4-336 and 4-343(c). The duties of the Contractor are as defined in 24 CCR § 4-343. Contractor shall keep and make available a copy of Title 24 of the CCR at the job site at all times.
- c. Where any item of fabricated materials and/or equipment, indicated on drawings or specified is unobtainable and it becomes necessary, with the consent of the Architect and District, to substitute equivalent items differing in details or design, the Contractor shall promptly submit complete drawings and details indicating the necessary modifications of the work. To the extent the items represent a lower cost to contractor than what was originally specified, District shall be entitled to a corresponding decrease in the contract price. This provision shall be governed by the terms of the General Conditions regarding Submittals, Shop Drawings, Cuts and Samples.
- d. With respect to work performed at or near a school site, Contractor shall at all times take all appropriate measures to ensure the security and safety of students and staff, including, but not limited to, ensuring that all of Contractor's employees, Subcontractors, and suppliers entering school property strictly adhere to all applicable District policies and procedures, e.g., sign-in requirements, visitor badges, and access limitations.

**Article 11. SUBCONTRACTORS & SUBCONTRACTING**

- a. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the District. The District shall be deemed to be the third party beneficiary of the contract between the Contractor and each Subcontractor. If the Contractor does not specify a Subcontractor for any portion of the work to be performed under this Contract, as required by law, Contractor shall perform that portion of the work with its own forces. The Contractor shall not substitute any other person or firm as a Subcontractor for those listed in the bid submitted by the Contractor, without the written approval of the District and in conformance with the requirements of the Public Contract Code, including but not limited to sections 4100, et seq.. The District reserves the right of approval of all Subcontractors proposed for use on this Project, and to this end, may require financial, performance, and such additional information as is needed to secure this approval. If a Subcontractor is not approved, the Contractor shall promptly submit another firm of the same trade for approval.
- b. The Contractor shall insert appropriate provisions in all subcontracts pertaining to work on this Project requiring the Subcontractors to be bound by all applicable terms of the Contract Documents. The Contractor shall be as fully responsible for the acts and omissions of the Subcontractors, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by the Contractor
- c. Substitution or addition of subcontractors shall be permitted only as authorized in California Public Contract Code Sections 4100 et seq.

**Article 12. CONFERENCES AND MEETINGS**

- a. A material obligation of the Contractor under the Contract Documents is the attendance at required meetings by the Contractor's supervisory personnel for the Work. The Contractor's personnel participating in conferences and meetings relating to the Work shall be authorized to act on behalf of the Contractor and to bind the Contractor.
- b. Pre-Construction Conference: The Contractor's representatives and those representatives of the subcontractors as requested by the District, shall attend a Pre-Construction Conference at such time and place as designated by the District. The Pre-Construction Conference will generally address the requirements of the Work and Contract Documents, and to establish construction procedures.
- c. Progress Meetings: Progress Meetings will be conducted on regular intervals (weekly unless otherwise agreed to by the Parties). The Contractor's representatives will attend the meeting, which shall be chaired by the Construction Manager or Architect, as designated. Contractor shall submit all Change Order Requests for initial review by the District at the Progress Meeting.
- d. Meeting Minutes: The Architect or Construction Manager will prepare and distribute minutes reflecting the items addressed and actions taken at a meeting or conference.

**Article 13. REQUESTS FOR INFORMATION**

- a. Contents of RFI: Any Requests for Information ("RFI") shall reference all applicable Contract Document(s), including Specification Section, detail(s), page number(s), drawing numbers(s) and sheet number(s), etc. The Contractor shall make suggestions and interpretations of the issues raised by each Request for Information. By itself, an RFI cannot modify Project price, scheduled completion date or the Contract Documents.
- b. Unnecessary RFIs: The Contractor may be responsible for any costs incurred for professional services the District may deduct from any amounts owing to the Contractor, if any RFI requests an interpretation or decision of a matter where the information is equally available to the party making the request.

**Article 14. SAFETY/PROTECTION OF PERSONS AND PROPERTY**

- a. Contractor will be solely and completely responsible for conditions of the Work Site, including safety of all persons and property during the performance of the Work. This will apply continuously and not be limited to normal working hours. The wearing of hard hats will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.
- b. The Contractor shall furnish to the District a copy of the Contractor's safety plan within thirty (30) after the issuance of the Notice to Proceed. Contractor shall designate a responsible member of the company to post information regarding protection and obligations of workers, to comply with reporting and other occupational safety requirements. 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 Administration, Contractor shall correct such violation promptly. Upon notice from the District of a safety or health complaint from the surrounding community, Contractor shall work with the District to address the complaint, including where applicable, modifying the schedule and/or the manner of work to avoid undue disruption or safety risks to the community.

**Article 15. PERFORMANCE AND PAYMENT BONDS**

- a. Contractor shall file with the District the following bonds, using the bond forms provided with these Contract Documents:
  - 1) A corporate surety bond, in a sum not less than 100 percent of the amount of the Contract, to guarantee the faithful performance of the Contract.
  - 2) A corporate surety bond, in a sum not less than 100 percent of the amount of the Contract, to guarantee the payment of wages for services engaged and of bills contracted for materials, supplies, and equipment used in the performance of the Contract.
- b. Corporate sureties on these bonds and on bonds accompanying bids must be admitted sureties as defined by law, legally authorized to engage in the business of furnishing surety bonds in the State of California. All sureties and bond forms must be satisfactory to the District. Failure to submit the required bonds within the time specified by the Notice of Intent to Award, using the forms provided by the District, may result in cancellation of the award of Contract and forfeiture of the Bid Bond.
- c. The amount of the Contract, as used to determine the amounts of the bonds, shall be the total amount fixed in the Contractor's proposal for the performance of the required work.
- d. During the period covered by the Contract, if any of the sureties upon the bonds shall become insolvent or unable, in the opinion of the District, to pay promptly the amount of such bonds to the extent to which surety might be liable, the Contractor, within thirty (30) days after notice given by the District to the Contractor, shall provide supplemental bonds or otherwise substitute another and sufficient surety approved by the District in place of the surety becoming insolvent or unable to pay. If the Contractor fails within such thirty (30) day period to substitute another and sufficient surety, the Contractor shall, if the District so elects, be deemed to be in default in the performance of its obligations hereunder and upon the bid bond, and the District, in addition to any and all other remedies, may terminate the Contract or bring any proper suit or other proceedings against the Contractor and the sureties or any of them, or may deduct from any monies then due or which thereafter may become due to the Contractor under the Contract, the amount for which the surety, insolvent or unable to pay, shall have been liable on the bonds, and the monies so deducted shall be held by the District as collateral security for the performance of the conditions of the bonds.

**Article 16. TIME**

- a. The Contractor shall commence the work on the date indicated in the Notice to Proceed. Time is of the essence regarding the Contract work, and the Contractor shall prosecute the work diligently and regularly at such a rate of progress as to ensure completion of this Project within, or sooner than, the time specified.
- b. The Contractor and Subcontractors shall investigate and become aware of the amount of time required for the delivery of all equipment and materials required to perform the work under this Contract, and no extension of time shall be granted due to failure to order the equipment and materials sufficiently before their incorporation into the work so as to avoid delay to the Project.
- c. The Contractor and Subcontractors shall provide and maintain enough manpower, materials and equipment to ensure a rate of construction progress that will complete the Project within or sooner than the time specified and according to the schedule of work. If, in the District's opinion, the Contractor and/or Subcontractors are not prosecuting the work at a sufficient rate of progress to meet the Project schedule, the District may direct the Contractor to provide additional manpower, materials or equipment, or to work additional hours, holidays or weekends without additional cost to the District until the work is progressing

in a manner satisfactory to the District. Failure to prosecute the work in a timely manner according to the Project schedule is considered a breach of Contract and shall be cause for termination of the Contract.

**Article 17. CONSTRUCTION SCHEDULE**

- a. Within fifteen (15) calendar days after the award of the Contract, the Contractor shall prepare and submit to the Architect and District an as-planned construction schedule showing in detail how the Contractor plans to prosecute the work within the time set for Final Completion. The schedule shall include the work of all trades necessary for construction of the Project, and shall be sufficiently complete and comprehensive to enable progress to be monitored on a day-by-day basis. The information for each activity shall include at a minimum the activity description, duration, start date and completion date. The first payment will not be made unless the District has been provided and has accepted the project schedule.
- b. The Contractor shall take care in the preparation of the schedule to ensure that it represents an accurate and efficient plan for accomplishing the work. If the Project is more than one week behind schedule, it must be promptly revised showing how the Contractor plans to complete the work, but in no case shall it show a completion date later than that required by the Contract, unless a time extension has been granted. The current schedule shall be kept posted in the Contractor's project office on site. All required schedules shall be periodically updated to reflect changes in the status of the job, including weather delays. At a minimum, the Contractor shall be required to provide and keep updated a monthly schedule in order to prevent delay claims. Contractor shall, at the request of the District, prepare a recovery schedule when Contractor's Work has fallen behind schedule.
- c. The Contractor shall be responsible for the coordination of all work necessary and pertaining to the construction whether actually a part of this Contract or attendant thereto. The Contractor shall notify the District and various utility companies, as far as possible in advance of their required work, in order that work schedules may be developed for all concerned, which will permit the most effective and timely accomplishment of the entire Project.

**Article 18. DELAYS AND TIME EXTENSIONS**

- a. The Contractor may be granted a time extension if the Contractor encounters an unavoidable delay of the work due to causes completely beyond the Contractor's control and which the Contractor could not have avoided by the exercise of reasonable care, prudence, foresight and diligence. Causes for which a claim for extension of time may be made include: acts of the public enemy, acts of another contractor in the performance of another contract with the District, priority of a governmental agency for materials or equipment, fire, flood, violent wind storm, pandemic, epidemic, quarantine restriction, strike, freight embargo, or weather of an unusually severe nature. The Contractor will not be granted time extensions for weather conditions which are normal for the location of the Project, according to the U.S. Weather Bureau Records.
- b. A request for extension of time and compensation related thereto shall be made in writing to the Architect and District within ten (10) calendar days of the date the delay is encountered, or shall be deemed waived. The request shall include a detailed description of the reasons for the delay and corrective measures by the Contractor. The request shall be accompanied by evidence that the insurance policies required by the Contract shall be in effect during the requested additional period of time. In order for the Architect to consider a request for time extension, the Contractor must prove that the reasons stated for the delay actually caused a delay in portions of the work which will result in completion beyond the date specified in the Contract. The Contractor may also be granted a time extension for a significant change in the scope of work which request for extension of time shall be included in a Contract modification proposal.
- c. No damages or compensation or any kind shall be paid to a Contractor because of delays in the progress of

work, whether such delays be avoidable or unavoidable, that are not the responsibility of District. District's liability to Contractor for delays for which District is responsible shall be limited to an extension of time unless such delays were unreasonable under the circumstances involved and were not within the contemplation of the Parties when the Contract was awarded. The Contractor shall provide to the District the actual, substantiated costs to Contractor for which the Contractor may claim damages from District. Such costs, if any, shall be directly related to the Project, and shall not include costs that would be borne by the Contractor in the regular course of business, including, but not limited to, home office overhead and ongoing insurance costs. Delay damages shall not include Contractor or Subcontractor markup for overhead and profit, but only actual, documented, and direct actual costs. The District shall not be liable for any damages which the Contractor could have avoided by any reasonable means including, but not limited to, the more judicious handling of forces or equipment.

- d. The granting of an extension of time because of unavoidable delays shall in no way operate as a waiver on the part of the District of the right to collect liquidated damages for other delays or of any other rights to which the District is entitled.

**Article 19. LIQUIDATED DAMAGES**

- a. The Parties understand and agree that the goodwill, educational process, and other business of District will be damaged if the Project is not completed and the Improvements cannot be occupied by the date of the stated Project completion. The Parties have further agreed that the exact amount of damages for failure to complete the Work within the time specified is, in some cases, extremely difficult, impractical, or impossible to determine. As to those damages that are difficult, impractical, or impossible to determine, should the Contractor fail to achieve Substantial Completion of this Contract within the time fixed for Substantial Completion, together with extensions granted by the District for unavoidable delays, Contractor shall become liable to the District in the amount specified in the Contract per calendar day for each day the Contract remains incomplete beyond the time for Substantial Completion, as liquidated damages and not as a penalty. Contractor shall not be charged with liquidated damages when the delay in completion of the work beyond the time for Substantial Completion is due to acts of the District. These liquidated damages will compensate the District only for its loss of use and the inability to occupy or otherwise utilize the Improvements. The costs and fees, including attorneys' fees, incurred by the District and its consultants and suppliers for extended performance as the result of any delays shall be added in Article 19.b., as set forth below.
- b. In addition to any liquidated damages which may be assessed, if Contractor fails to achieve Substantial Completion of this Contract within the time fixed for Substantial Completion, together with extensions granted by the District for unavoidable delays, and if as a result District finds it necessary to incur any costs and/or expenses, or if District receives any claims by other contractors, subcontractors, or third parties claiming time or other compensation by reason of Contractor's failure to complete work on time, Contractor shall pay all those costs and expenses incurred by District. These costs and expenses may include but are not limited to such items as rental payments, extended performance by the architect, construction manager and Project Inspector, increased insurance costs, equipment rentals and allocable administrative salaries, whether related to the acquisition of facilities or caused by the delay in completion. The District may, without waiving any of its rights, assess liquidated damages after Substantial Completion of the Project.
- c. Any money due or to become due to the Contractor may be retained to cover liquidated and other delay damages. Should such money not be sufficient to cover those damages, the District shall have the right to recover the balance from the Contractor or Contractor's sureties.
- d. Should the District authorize suspension of the work for any cause, the time work is suspended will be added to the time for completion. Suspension of the work by the District shall not be a waiver of the right to claim liquidated or other delay damages as set forth in this section.

**Article 20. ASSIGNMENT**

Contractor shall not assign this Contract or any part thereof without prior written consent of District. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or material supplied for performance of the Work called for under said Contract in favor of all persons, firms, or corporations rendering such services or supplying such materials to the extent that claims are filed pursuant to the Civil Code, the Code of Civil Procedure, and/or the Government Code. If Contractor attempts to make such an assignment without such consent, Contractor shall nevertheless remain legally responsible for all obligations under the Contract.

**Article 21. PROHIBITED INTERESTS**

No official of the District and no District representative who is authorized in such capacity and on behalf of the District to negotiate, make, accept, or approve, or to take part in negotiating, making, accepting or approving any engineering, inspection, construction or material supply contract or any subcontract in connection with construction of the Project, shall be or become directly or indirectly interested financially in this Contract or in any part thereof. No officer, employee, attorney, engineer or inspector of or for the District who is authorized in such capacity and on behalf of the District to exercise any executive, supervisory or other similar functions in connection with construction of the Project, shall become directly or indirectly interested financially in this Contract or in any part thereof.

**Article 22. SEPARATE CONTRACTS**

District reserves the right to let other contracts in connection with this Work or other work at the same site. Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly connect and coordinate his Work with theirs.

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

To ensure proper execution of his subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the District any discrepancy between executed work and the Contract Documents.

Contractor shall ascertain to his 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 to the end that Contractor may perform this Contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy at the Project site. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on project. If simultaneous execution of any contract for the Project is likely to cause interference with performance of some other contract or contracts, 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. District shall not be responsible for any damages suffered or for extra costs incurred by Contractor resulting directly or indirectly from award, performance, or attempted performance of any other contract or contracts on the Project, or caused by any decision or omission of District respecting the order of precedence in performance of contracts.

**Article 23. COORDINATION WITH OTHER CONTRACTS**

- a. The District reserves the right to do other work or award other contracts in connection with this Project. By entering into this Contract, Contractor acknowledges that there may be other contractors on or adjacent to the Project site whose work must be coordinated with that of its own. Contractor expressly warrants and agrees that it will cooperate with other contractors and will do nothing to delay, hinder, or interfere with the work of other contractors, or that of the District, its Architect and Construction Manager. Contractor



also expressly agrees that in the event its work is hindered, delayed, interfered with, or otherwise affected by a separate contractor, its sole remedy will be a direct action against the separate contractor. To the extent allowed by law, the Contractor expressly waives any remedy against the District, its Architect and Construction Manager on account of delay, hindrance, interference or other such events caused by a separate contractor.

- b. If any part of Contractor's work depends upon the work of a separate contractor, Contractor shall inspect such other work and promptly report in writing to the District and Architect any defects in such other work that render it unsuitable to receive the work of Contractor. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other contractor's work, except as to defects which the Contractor could not have detected through the reasonable inspection of the other contractor's work prior to the execution of Contractor's work.
- c. If Contractor is aware of a current or potential conflict between Contractor's work and the work of another contractor on the site, and is unable to informally resolve the conflict directly with the other contractor, Contractor shall promptly provide written notice to the District, with a copy to the Architect and the other contractor, specifying the nature of the conflict, the date upon which the conflict arose, and the steps taken to attempt to resolve the conflict. The District may issue written instructions to address the conflict.

**If, through Contractor's negligence, any other contractor or subcontractor shall suffer loss or damage to the work, Contractor shall make a reasonable effort to settle with such other contractor and subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the District or Architect, on account of any damage alleged to have been so sustained, the District or Architect shall notify the Contractor, who shall defend such proceedings at Contractor's own expense and save harmless and indemnify the District and the Architect from any such claim.**

**Article 24. DISTRICT'S RIGHT TO STOP WORK; TERMINATION OR SUSPENSION OF THE CONTRACT**

a. District's Right to Stop Work:

In addition to or as an alternative to any and all other remedies available to the District, if the Contractor fails to correct work which is not performed in accordance with the Contract Documents, or if the Contractor persistently fails to perform the work in accordance with the Contract Documents, the District may by written order direct the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated to the satisfaction of the District. However, the right of the District to stop the work shall not give rise to a duty on the part of the District to exercise this right for the benefit of the Contractor or any other person or entity, and the failure of the District to do so shall not be raised as a defense to the Contractor's failure to perform the work in accordance with the Contract Documents.

b. Termination for Cause:

- 1) If the Contractor refuses or fails to furnish sufficient materials, work force, equipment, and appurtenances to properly prosecute the work in a timely manner, or if Contractor refuses or fails to comply with any provisions of the Contract Documents, or if Contractor should file a bankruptcy petition or make a general assignment for the benefit of Contractor's creditors or if a receiver should be appointed on account of Contractor's insolvency, then the District may give the Contractor and Contractor's Surety written notice of intention to terminate the Contract. Unless within seven (7) calendar days after the serving of such notice upon the Contractor and Contractor's Surety such violation shall cease and arrangements for correction of such conditions shall be made satisfactory to the District, the Contract shall cease and terminate. In the event of such termination, the District shall immediately serve written notice thereof upon the Contractor and Contractor's Surety.

- 2) In the event of termination for cause, in addition to all remedies available to the District, the Contractor's Surety shall have the right to take over and perform the Contract; provided, however, that if the Surety does not commence performance within five (5) calendar days from the date of the issuance of such notice of termination, the District may take over the work and prosecute the same to completion by letting another Contract, or by any other method that the District deems advisable. The Contractor and Contractor's Surety shall be liable for any excess cost incurred by the District thereby, and in any such event the District may take possession of such materials, equipment, and other property belonging to the Contractor as may be on the site and use same in completing the work.

c. Termination or Suspension for Convenience:

The District reserves the right, in its sole discretion, to terminate or suspend all or part of the Contract for convenience following three (3) days written notice to the Contractor. In the event of termination or suspension for convenience, Contractor shall have no claims against the District, except:

- 1) The actual cost of labor, materials and services provided pursuant to the Contract, and which have not yet been paid for, as documented by timesheets, invoices, receipts and the like; and
- 2) Five percent (5%) of the total cost of the work performed as of the date of notice of termination or suspension or five percent (5%) of the value of the work yet to be completed, whichever is less. The Parties agree that this amount shall constitute full and fair compensation for all Contractor's lost profits and other damages resulting from the termination or suspension for convenience.

**Article 25. GUARANTEE**

Contractor warrants to the District 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. The Contractor's warranty does not cover damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the District, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. So long as District forwards written notification of any warranty item to Contractor within the warranty period, Contractor's obligation to correct the warranty item continues until the correction is made. As stated in the Project Warranty form, the warranty period is at least two years. In the event of failure of the Contractor to repair a defect within seven (7) days after being notified in writing, the District is hereby authorized to proceed to have defects repaired and made good at expense of the Contractor who shall pay costs and charges therefore immediately on demand.

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 or to prevent interruption of operations of 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 request 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 provide such attention. The costs of such correction or attention shall be charged against the Contractor. Such action by the District will not relieve the Contractor of the guarantees provided in this Article or elsewhere in this Contract.

This Article does not in any way limit the guarantee on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish District with all appropriate guarantee or warranty certificates, in a form acceptable to District, prior to the final payment made to Contractor.

**Article 26. NOTICE AND SERVICE THEREOF**

- a. Any notice from one Party to the other under the Contract shall be in writing and shall be dated and signed by the Party giving such notice or by the duly authorized representative of such Party. Any such notice shall not be effective for any purpose whatsoever unless served in one of the following manners:
  - 1) If notice is given to District, by personal delivery thereof to District's representative or by depositing same in United States mail, enclosed in a sealed envelope addressed to District for attention of said representative or District, postage prepaid and registered;
  - 2) If notice is given to Contractor, by personal delivery thereof to said Contractor or to his foreman at site of the Project, or by depositing same in United States mail, enclosed in a sealed envelope addressed to said Contractor at his regular place of business or at such other address as may have been established for the conduct of work under this contract, postage prepaid and registered;
  - 3) If notice is given to surety or other person, by personal delivery to such surety or other person or by depositing same in United States mail, enclosed in a sealed envelope addressed to such surety or person at the address of such surety or person last communicated by him to Party giving notice, postage prepaid and registered.
  - 4) If notice is served by mail, it shall be deemed received and all time periods associated with the giving of notice shall run from the third day after mailing.

**Article 27. WORKERS**

- a. Contractor shall at all times enforce strict discipline and good order among his employees. Contractor shall not employ on work any unfit person or anyone not skilled in work assigned to him.
- b. Any person in the employ of the Contractor whom the District may deem incompetent or unfit shall be dismissed from work and shall not again be employed on it except with the written consent of District.
- c. The District reserves the right to request that the Project Supervisor be replaced immediately.

**Article 28. WAGE RATES, PAYROLL RECORDS AND DEBARMENT**

- a. The Contractor is aware of the requirements of California Labor Code sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. Since this Project involves an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and since the total compensation is \$1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Agreement from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at [www.dir.ca.gov/dlsr/](http://www.dir.ca.gov/dlsr/). In the alternative, the Contractor may view a copy of the prevailing rates of per diem wages at the District's Facilities Department. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor's principal place of business and at the Project site. Contractor shall defend, indemnify and hold the District, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or allege failure to comply with the Prevailing Wage Laws.
- b. The Contractor and each subcontractor shall forfeit as a penalty to the District not more than Two Hundred

Dollars (\$200) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing wage rate for any work done by him, or by any subcontract under him, in violation of the provisions of the California Labor Code. The difference between such stipulated prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

- c. As a further material part of this Contract, Contractor agrees to hold harmless and indemnify the District, its Board members, and its officers, employees and agents from any and all claims, liability, loss, costs, damages, expenses, fines and penalties, of whatever kind or nature, including all costs of defense and attorneys' fees, arising from any alleged failure of Contractor or its subcontractors to comply with the Prevailing Wage Laws of the State of California. If the District or any of the indemnified parties are named as a party in any dispute arising from the failure of Contractor or its subcontractors to pay prevailing wages, Contractor agrees that the District and the other indemnified parties may appoint their own independent counsel, and Contractor agrees to pay all attorneys' fees and defense costs of the District and the other indemnified parties as billed, in addition to all other damages, fines, penalties and losses incurred by the District and the other indemnified parties as a result of the action.
- d. Accurate payroll records shall be kept by the Contractor and each subcontractor, showing the name, address, social security number, work classification, 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 Work.
- e. It shall be the responsibility of Contractor to comply with Labor Code section 1776 as it may be amended by the Legislature from time to time with respect to each payroll record. Labor Code section 1776 provides in relevant part,

(a) Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

- (1) The information contained in the payroll record is true and correct.
- (2) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.

(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:

- (1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.
- (2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
- (3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, 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), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

(c) Unless required to be furnished directly to the Labor Commissioner in accordance with paragraph (3) of subdivision (a) of Section 1771.4, 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. The payroll records may consist of printouts of payroll data that are maintained as computer records, if the printouts contain the same information as the forms provided by the division and the printouts are verified in the manner specified in (a) above.

(d) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

(e) Except as provided in subdivision (f), any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, 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 performing the contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a multiemployer Taft-Hartley trust fund (29 U.S.C. Sec. 186(c)(5)) that requests the records for the purposes of allocating contributions to participants shall be marked or obliterated only to prevent disclosure of an individual's full social security number, but shall provide the last four digits of the social security number. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (29 U.S.C. Sec. 175a) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

(f) (1) Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided non-redacted copies of certified payroll records. Any copies of records or certified payroll made available for inspection and furnished upon request to the public by an agency included in the Joint Enforcement Strike Force on the Underground Economy or to a law enforcement agency investigating a violation of law shall be marked or redacted to prevent disclosure of an individual's name, address, and social security number.

(2) An employer shall not be liable for damages in a civil action for any reasonable act or omission taken in good faith in compliance with this subdivision.

(g) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

(h) The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit One Hundred

Dollars (\$100) 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. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

(i) The body awarding the contract shall cause to be inserted in the contract stipulations to effectuate this section."

- f. Debarment. The Contractor or any subcontractor working under the Contractor may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Section 1777.1 or Section 1777.7 of the California Labor Code. Any contract on a public works project entered into between the Contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid, or may have been paid to a debarred subcontractor by the Contractor on the project shall be returned to the District. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the project.

**Article 29. APPRENTICES**

Contractor's attention is directed to the provisions of Sections 1777.5, 1777.6, and 1777.7 of the California Labor Code concerning employment of apprentices by the Contractor or any subcontractor under him. The Contractor shall be knowledgeable of and comply with all California Labor Code sections including 1727, 1773.5, 1775, 1777, 1777.5, 1810, 1813, 1860, including all amendments; each of these sections is incorporated by reference into this Contract. The responsibility for compliance with these provisions for all apprenticeable occupations rests with the Contractor. Knowing violations of Section 1777.5 will result in forfeiture not to exceed \$100 for each calendar day of non-compliance pursuant to Section 1777.7.

**Article 30. HOURS OF WORK**

- a. As provided in article 3 (commencing at section 1810), chapter 1, part 7, division 2 of the Labor Code, eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by the Contractor or by any subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as hereinafter provided. Notwithstanding the provisions herein above set forth, work performed by employees of Contractor in excess of eight (8) hours per day, and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.
- b. The Contractor and every subcontractor shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by him in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of the District and to the Division of Labor Law Enforcement, Department of Industrial Relations of the State of California.
- c. The Contractor shall pay to the District a penalty of twenty-five dollars (\$25) for each worker employed in the execution of this Contract by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one calendar week in violation of the provisions of article 3 (commencing at section 1810), chapter 1, part 7, division 2 of the Labor Code.

- d. Any work necessary to be performed after regular working hours or on Sundays or other holidays shall be performed without additional expense to District. Refer to Special Conditions for information on specific time-of-day and weekend hour restrictions which apply to this Contract.
- e. For projects occurring on or adjacent to an operating school site, Contractor shall schedule activities to ensure education operations will not be unduly disrupted by significant noise, dust or other impacts reasonably expected to be disruptive to any educational or District programs.

**Article 31. INSURANCE**

- a. Contractor shall obtain insurance from a company or companies acceptable to District. All required insurance must be written by an admitted company licensed to do business in the State of California at the time the policy is issued. All required insurance shall be equal to or exceed an A VIII rating as listed in Best’s Insurance Guide’s latest edition. On a case-by-case basis, the District may accept insurance written by a company listed on the State of California Department of Insurance List of Eligible Surplus Lines (“LESLI List”) with a rating of A:VIII or above as listed in Best’s Insurance Guides’ latest edition. Required documentation of such insurance shall be furnished to the District within the time stated in the Notice of Intent to Award. Contractor shall not commence work nor shall it allow its employees or Subcontractors or anyone to commence work until all insurance required hereunder has been submitted and approved by the District and a notice to proceed has been issued.
- b. Company or companies providing insurance coverage shall be acceptable to the District and authorized to conduct business in the State of California.
- c. Contractor shall take out and maintain at all times during the life of this Contract, up to the date of acceptance of the work by the District, the following policies of insurance:
  - 1) **General Liability Insurance:** Personal injury and replacement value property damage insurance for all activities of the Contractor and its Subcontractors arising out of or in connection with this Contract, written on a comprehensive general liability form including contractor’s protected coverage, blanket contractual, completed operations, vehicle coverage and employer’s non-ownership liability coverage, in an amount no less than either:
    - (a) \$1,000,000.00 combined single limit personal injury and property damage for each occurrence and \$2,000,000.00 annual aggregate with a \$2,000,000.00 umbrella/excess; or
    - (b) \$2,000,000.00 annual combined single limit.

Contractor shall procure and maintain during the life of this Contract and for such other period as may be required herein, at its sole expense, such comprehensive general liability insurance or commercial general liability and property damage insurance as shall protect Contractor and District from all claims for bodily (personal) injury, including accidental death, as well as claims for property damage arising from operations under this Contract, and other covered loss, however occasioned, occurring during the policy term. Such policy shall comply with all the requirements of this Article, and shall be in the form and amounts as set forth in the Special Conditions. The limits set forth in the Special Conditions shall not be construed to relieve the Contractor from liability in excess of such coverage, nor shall it limit Contractor's indemnification obligations to the District, and shall not preclude the District from taking such other actions available to the District under other provisions of the Contract Documents or law.

Any general liability policy provided by Contractor hereunder shall contain an endorsement which applies its coverage to District, members of District’s Board of Education, and the officers, agents,

employees and volunteers of District, the State Allocation Board, if applicable, and the District's consultants, individually and collectively, as additional insureds using form CG2010 11-85 or equivalent which must include products and completed operations coverage, broad form property damage coverage, coverage for collapse, explosion and underground, and include independent contractor coverage.

Contractor shall notify District in writing of the amount, if any, of self-insured retention provided under the General Liability coverage, with a maximum limit of \$25,000. District may approve higher retention amounts, based upon review of documentation submitted by Contractor. Such review shall take into consideration Contractor's net worth and reserves for payment of claims of liability against Contractor, which must be sufficient to adequately compensate for the lack of other insurance coverage required hereunder.

All general liability policies shall be written to apply to all bodily injury, including death, property damage, personal injury and other covered loss, however occasioned, occurring during the policy term, and shall specifically insure the performance by Contractor of that part of the indemnification contained in Article 33 hereof, relating to liability for injury to or death of persons and damage to property. If the coverage contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any aggregate limit has been paid or reserved, District may require additional coverage to be purchased by Contractor to restore the required limits. Contractor may combine primary, umbrella, and as broad as possible excess liability coverage to achieve the total limits indicated above. Any umbrella or excess liability policy shall include the additional insured endorsement, products and completed operations coverage and broad form property damage described in paragraphs (d) and (e), above. To the extent that the umbrella insurer requires notice of changes to the primary policy, notice will be considered to be given and not prejudice the District's rights to recover under the umbrella policy.

Contractor and District release each other, and their respective authorized representatives, from any Claims (as further defined in Article 33), but only to the extent that the proceeds received from any policy of liability insurance carried by District or Contractor, other than any self-insurance, covers any such Claim or damage. Included in any policy or policies of liability insurance provided by Contractor hereunder shall be a standard waiver of rights of subrogation against District by the insurance company issuing said policy or policies.

2) **Builders Risk Insurance:**

\_\_\_\_\_ Contractor is not required to procure and maintain builders' risk insurance (all-risk coverage).

Contractor shall procure and maintain builders' risk insurance (all-risk coverage) on a one hundred percent completed value basis on the insurable portion of the project for the benefit of the District, and the Contractor and subcontractor as their interest may appear.

It is the Contractor's responsibility to maintain or cause to be maintained builder's risk insurance or applicable installation coverage on all work, material, equipment, appliances, tools, and structures which are a part of the Contract and subject to loss or damage by fire, extended coverage, and vandalism and malicious mischief. District accepts no responsibility until the Contract is formally accepted by the Governing Board for the Work. The Contractor is required to file with the District a certificate evidencing builder's risk or applicable installation of not less than the amount identified in the Special Conditions insurance coverage.



Provide insurance coverage on completed value form, all-risk or special causes of loss coverage.

1. Insurance policies shall be so conditioned as to cover the performance of any extra work performed under the Contract.
  2. Coverage shall include all materials stored on site and in transit.
  3. Coverage shall include Contractor's tools and equipment.
  4. Insurance shall include boiler, machinery, and material hoist coverage.
- 3) **Automobile Liability Insurance:** Covering bodily injury and property damage in an amount no less than **\$1,000,000 combined single limit for each occurrence**. Such insurance shall include coverage for owned, hired, and non-owned vehicles and be included on the umbrella/excess policy.
- d. The certificate(s) for the General Liability Policy(ies) and the Automobile Liability Policy specified above must state that the insurance is under an occurrence based, and not claims made, policy(ies) and shall be endorsed with the following specific language:
- The “Cotati-Rohnert Park Unified School District” is an additional insured for all liability arising out of the operations by or on behalf of the named insured, and this policy protects the additional insured, its officers, agents and employees against liability for bodily injuries, deaths or property damage or destruction arising in any respect directly or indirectly in the performance of the Contract.”
- e. The certificate(s) for the both the General Liability Policy and the Automobile Liability Policy, as well the Builders’ Risk Policy if required above, shall be endorsed with the following specific language:
- 1) The inclusion of more than one insured shall not operate to impair the rights of one insured against another insured and the coverages afforded shall apply as though separate policies have been issued to each insured.
  - 2) The insurance provided herein is primary and no insurance held or owned by the District shall be called upon to contribute to a loss.
  - 3) Coverage provided by this policy shall not be reduced or canceled without thirty (30) days written notice given to the Owner by certified mail.
  - 4) This policy does not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.
  - 5) The certificates must state that the insurance is under an occurrence based, and not a claims-made, or “modified occurrence,” policy (policies).
- f. Within ten (10) days following issuance of the Notice of Intent to Award of the Contract, the following documentation of insurance shall be submitted to District for approval prior to issuance of the Notice to Proceed: Certificates of insurance showing the limits of insurance provided, certified copies of all policies, and signed copies of the specified endorsements for each policy. At the time of making application for an extension of time, the Contractor shall submit evidence that the insurance policies will be in effect during the requested additional period of time.
- g. If the Contractor fails to maintain such insurance, the District may take out such insurance to cover any damages of the above mentioned classes for which the District might be held liable on account of the Contractor’s failure to pay such damages, and deduct and retain the amount of the premiums from any sums due the Contractor under the Contract.

**h. Workers' Compensation Insurance:**

- 1) Within ten (10) calendar days following issuance of the Notice of Intent to Award of the Contract, the Contractor shall furnish to the District satisfactory proof that the Contractor and all Subcontractors it intends to employ have procured, for the period covered by the Contract, full Workers' Compensation insurance and employer's liability with limits of at least \$1,000,000 with an insurance carrier satisfactory to the District for all persons whom the Contractor may employ in carrying out the work contemplated under this Contract in accordance with the Workers' Compensation Insurance and Safety Act, approved May 26, 1913, and all acts amendatory or supplemental thereto (the "Act"). Such insurance shall be maintained in full force and effect during the period covered by the Contract. In the event the Contractor is self-insured, Contractor shall furnish a Certificate of Permission to Self-Insure, signed by the Department of Industrial Relations Administration of Self-Insurance, Sacramento, California.
  - 2) If the Contractor fails to maintain such insurance, the District may take out worker's compensation insurance to cover any compensation which the District might be liable to pay under the provisions of the Act, by reason of any employee of the Contractor being injured or killed, and deduct and retain the amount of the premiums for such insurance from any sums due the Contractor under the Contract, or otherwise recover that amount from the Contractor or the Surety.
  - 3) If an injury occurs to any employee of the Contractor for which the employee, or the employee's dependents in the event of the employee's death, is entitled to compensation under the provisions of the Act, or for which compensation is claimed from the District, the District may retain from the sums due the Contractor under this Contract an amount sufficient to cover such compensation, as fixed by the Act, until such compensation is paid, or until it is determined that no compensation is due, and if the District is compelled to pay such compensation, it will deduct and retain from such sums the amount so paid, or otherwise recover this sum from the Contractor or its Surety.
  - 4) The policies represented by the certificates shall be endorsed with a Waiver of Subrogation and must contain the provision (and the certificates must so state) that the insurance cannot be canceled until thirty (30) days after written notice of intended cancellation has been given to the District by certified mail.
- i. Contractor's failure to procure the insurance specified herein, or failure to deliver certified copies or appropriate certificates of such insurance, or failure to make the premium payments required by such insurance, shall constitute a material breach of the Contract, and District may, at its option, terminate the Contract for any such default by Contractor.
  - j. The requirements as to the types and limits of insurance coverage set forth herein and in the Special Conditions to be maintained by the Contractor, and any approval of said insurance by the District or its insurance advisor(s), are not intended to and shall not in any manner limit or qualify the liabilities and obligations otherwise assumed by the Contractor pursuant to the Agreement, including, but not limited to, the provisions concerning indemnification.
  - k. District shall retain the right at any time to review the coverage, form, and amount of insurance required herein and may require Contractor to obtain insurance reasonably sufficient in coverage, form and amount to provide adequate protection against the kind and extent of risk which exists at the time a change in insurance is required.
  - l. All deviations from the contractual insurance requirements stated herein must be approved in writing by District's risk manager.

**Article 32. PROOF OF CARRIAGE OF INSURANCE**

- a. Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California unless waived, in writing, by the District Risk Manager. Carrier(s) shall have an A.M. Best rating of not less than an A:VIII. Insurance deductibles or self-insured retentions must be declared by the Contractor, and such deductibles and retentions shall have the prior written consent from the District. At the election of the District, the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses.
- b. Contractor shall cause its insurance carrier(s) to furnish the District with either 1) a properly executed original Certificate(s) of Insurance and certified original copies of Endorsements effecting coverage as required herein, or 2) if requested to do so in writing by the District Risk Manager, provide original certified copies of policies including all endorsements and all attachments thereto, showing such insurance is in full force and effect. The District, its directors and officers, employees, agents or representatives shall be named as additional insureds and a waiver of subrogation shall be provided in favor of those parties. Further, said Certificate(s) and policies of insurance shall contain the covenant of the insurance carrier(s) that shall provide no less than thirty (30) days written notice be given to the District prior to any material modification or cancellation of such insurance. In the event of a material modification or cancellation of coverage, the District may terminate or stop the Work pursuant to the Contract Documents, unless the District receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing the coverage set forth herein and the insurance required herein is in full force and effect. Contractor shall not take possession, or use the Project site, or commence operations under this Contract until the District has been furnished original Certificate(s) of Insurance and certified original copies of endorsements or policies of insurance, including all endorsements and any and all other attachments as required in this Section. The original Endorsements for each policy and the Certificate of Insurance shall be signed by an individual authorized by the insurance carrier to do so on its behalf.
- c. It is understood and agreed to by the Parties hereto and the insurance company(ies), that the Certificate(s) of Insurance and policies shall so covenant and shall be construed as primary, and the District's insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory.
- d. The District reserves the right to adjust the monetary limits of insurance coverage during the term of this Contract, including any extension thereof, if in the District's reasonable judgment the amount or type of insurance carried by the Contractor becomes inadequate.
- e. Contractor shall pass down the insurance obligations contained herein to all tiers of sub-contractors working under this Contract.

**Article 33. INDEMNIFICATION**

Contractor shall defend (with counsel of District's choosing), indemnify and hold the District, its officials, officers, agents, employees, and representatives free and harmless from any and all claims, demands, causes of action, costs, expenses, liabilities, losses, damages or injuries, in law or equity, regardless of whether the allegations are false, fraudulent, or groundless, to property or persons, including wrongful death, to the extent arising out of or incident to any act, omission, breach, or willful misconduct of Contractor, its officials, officers, employees, agents, consultants and contractors arising out of or in connection with the performance of the Work or this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorneys' fees and other related costs and expenses. Contractor shall defend, at Contractor's own cost, expense and risk, with counsel of District's choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against

the District, its officials, officers, agents, employees and representatives. To the extent of its liability, Contractor shall pay and satisfy any judgment, award or decree that may be rendered against District, its officials, officers, employees, agents, employees and representatives, in any such suit, action or other legal proceeding. Contractor shall reimburse District, its officials, officers, agents, employees and representatives for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code Section 2782. Such indemnification shall extend to all claims, demands, or liabilities occurring after completion of the project as well as during the progress of the work. Pursuant to Public Contract Code § 9201, District shall timely notify Contractor of receipt of any third-party claim relating to this Project.

**Article 34. LAWS AND REGULATIONS**

- a. Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on conduct of the Work as indicated and specified. If Contractor observes that drawings and specifications are at variance therewith, he shall promptly notify the District in writing and any necessary changes shall be adjusted as provided in contract for changes in the Work. If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to District, he shall bear all costs arising therefrom.
- b. The Contractor shall be knowledgeable regarding and shall comply with applicable portions of California Code of Regulations Title 24, the applicable Building Code, and all other codes, ordinances, regulations or orders of properly constituted authority having jurisdiction over the work of this Project. The Contractor shall examine the Contract Documents for compliance with these codes and regulations and shall promptly notify the Architect of any discrepancies.
- c. All work and materials shall be in full accordance with the latest rules and regulations of the Safety Orders of the Division of Industrial Safety and the applicable State laws and/or regulations. Nothing in the Project plans or Specifications is to be construed to permit work not conforming to the applicable Codes. Buildings and/or all other construction covered by this Contract shall meet all the regulations for access by the physically handicapped as administered by the Division of the State Architect and as may be required by federal or state law. Contractor shall be responsible for familiarity with the Americans with Disabilities Act (ADA) (42 USC 12101 et seq.). Installations of equipment and other devices shall be in compliance with ADA regulations.
- d. If the work under this Contract is for the construction of a school building as defined by the Education Code, then the following provisions shall apply to the Contract:
  - 1) All work shall be executed in accordance with the current requirements of the Education Code and California Code of Regulations: Title 24 and Title 19. No deviations from the DSA approved plans and Specifications will be permitted except upon a Change Order or Addenda, signed by the District and Architect and approved by the Division of the State Architect and the State Fire Marshal, if applicable.
  - 2) The Division of the State Architect shall be notified 48 hours in advance of the first pour of concrete.

**Article 35. PERMITS AND LICENSES**

Permits and licenses necessary for prosecution of the Work shall be secured and paid for by Contractor, unless otherwise specified in the Contract Documents.

- a. Contractor shall obtain and pay for all other permits and licenses required for the Work, including excavation permit and for plumbing, mechanical and electrical work and for operations in or over public streets or right of way under the jurisdiction of public agencies other than the District.
- b. The Contractor shall arrange and pay for all off-site inspection of the Work related to permits and licenses, including certification, required by the specifications, drawings, or by governing authorities, except for such off-site inspections delineated as the District's responsibility pursuant to the Contract Documents.
- c. Before acceptance of the Project, the Contractor shall submit all licenses, permits, certificates of inspection and required approvals to the District.

**Article 36. INSPECTION FEES FOR PERMANENT UTILITIES AND EASEMENTS**

All inspection fees and other municipal charges for permanent utilities including, but not limited to, sewer, electrical, phone, gas, water, and irrigation shall be paid for by District. Contractor shall be responsible for arranging the payment of such fees, but inspection fees and other municipal fees relating to permanent utilities shall be paid by District. Contractor may either request reimbursement from District for such fees, or obtain the funds from District prior to paying such fees. Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the District, unless otherwise specified.

**Article 37. SURVEYS**

Surveys to determine location of property lines and corners will be supplied by the District. Surveys to determine locations of construction, grading, and site work shall be provided by the Contractor.

**Article 38. EXCISE TAXES**

If under federal excise tax law any transaction hereunder constitutes a sale on which a federal excise tax is imposed and the sale is exempt from such excise tax because it is a sale to a state or local government for its exclusive use, the District, upon request, will execute a certificate of exemption which will certify (1) that the District is a political subdivision of the state for the purposes of such exemption, and (2) that the sale is for the exclusive use of the District. No excise tax for such materials shall be included in any bid price.

**Article 39. PATENTS, ROYALTIES, AND INDEMNITIES**

The Contractor shall hold and save the District and its officers, agents, and employees harmless from liability of any nature 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 this contract, including its use by the District, unless otherwise specifically stipulated in the contract documents.

**Article 40. MATERIALS**

- a. Except as otherwise specifically stated in this contract, Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendency, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete this Contract within specified time.
- b. Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of good quality.

- c. Materials shall be furnished in ample quantities and at such times as to insure uninterrupted progress of work and shall be stored properly and protected as required. Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or work under this contract.
- d. No materials, supplies, or equipment for Work under this Contract 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 him, to District free from any claims, liens, or charges. Contractor further agrees that neither he nor any person, firm, or corporation furnishing any materials or labor for any Work covered by this Contract shall have any right to a lien upon premises or any improvement or appurtenance thereon, except that Contractor may install metering devices or other equipment of utility companies or of political subdivisions, 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 owner thereof. Nothing contained in this article, however, shall defeat or impair right of persons furnishing material or labor under any bond given by Contractor for their protection or any rights under any law permitting such persons to look to funds due to Contractor in the hands of the District, and this provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.
- e. Materials shall be stored on the Project site in such manner so as not to interfere with any operations of the District or any independent contractor.

**Article 41. SUBSTITUTIONS**

- a. Wherever in the drawings or Specifications a material or product is called for by trade or brand names or manufacturer and model number, alternative items of equal quality and purpose may be proposed for use by the Contractor, as specified in the Instructions to Bidders. The burden of proof of equality is on the Contractor, and Contractor shall furnish all information and supplies necessary for the Architect and District to make a thorough evaluation of the proposed substitution. The decision about the equality of the proposed substitution is final, and if the proposed substitution is not approved, the Contractor shall install the item called for. Proposed substitutions and any changes in adjacent work caused by them shall be made by the Contractor at no additional cost to the District.
- b. Proposed substitutions shall be submitted sufficiently before actual need to allow time for thorough evaluation. Substitutions shall not be proposed for the reason that submittals were not made early enough to avoid delay. The review of substitutions shall not relieve the Contractor from complying with the requirements of the drawings and Specifications.
- c. In the event Contractor makes substitutions in materials, equipment, or designs, with or without the District's approval, other than those authorized herein, the Contractor shall then assume full responsibility for the effects of such substitutions on the entire Project, including the design, and shall reimburse the District for any charges resulting from such substitutions, including any charges for modifications in the work of other trades, and including any charges for additional design and review, plus reasonable and customary mark-ups.

**Article 42. SUBMITTALS, SHOP DRAWINGS, CUTS AND SAMPLES**

- a. Five (5) copies of shop drawings, brochures and cuts and samples in quantities specified by the Architect shall be submitted to the Architect for all items for which they are required by the plans and Specifications.

Prior to transmittal, the Contractor shall examine all submittals for accuracy and completeness in order to verify their suitability for the work and compliance with the Contract Documents and shall sign and date each submittal. Submittals shall be made sufficiently before the items are required for the work so as to cause no delay and shall be in accordance with the Project construction schedule.

- b. In addition to information furnished as common practice, submittals shall contain the Project name and location, Contractor's name and address, Subcontractor's or supplier's name and address, date of submittal and any revisions, and reference to appropriate specification section, and/or drawing and detail numbers. The Contractor and/or the Subcontractors shall verify in the field all dimensions and relationships to adjacent work necessary to ensure the proper fit of the items submitted. If necessary, the Contractor shall make any corrections required and resubmit with all due haste in the same number as initially required.
- c. Review of submittals, shop drawings, cuts or samples by the District or Architect shall not relieve the Contractor from complying with the requirements of the Contract Documents.
- d. Any materials or equipment installed without approval shall be at the Contractor's own risk, and Contractor may be required to remove any such materials or equipment and install the specified items at Contractor's own cost, including repairs to adjacent work.

**Article 43. INSTRUCTIONS AND MANUALS**

Three (3) copies of the maintenance instructions, application/installation instructions and service manuals called for in the Specifications shall be provided by the Contractor. These shall be complete as to drawings, details, parts lists, performance data and other information that may be required for the District to easily maintain and service the materials and equipment installed under this Contract. All manufacturer's application/installation instructions shall be given to the Architect at least ten (10) days prior to first material application or installation of the item. The maintenance instructions and manuals, along with any specified guarantees, shall be delivered to the Architect for review prior to submitting to District, and the Contractor or appropriate Subcontractors shall instruct District's personnel in the operation and maintenance of the equipment prior to final acceptance of the Project.

**Article 44. CLOSEOUT SUBMITTALS**

The Contractor shall be responsible for the timely delivery of the technical manuals, warranties and guarantees as required in the technical specifications. The final payment will not be made until the District representative has had an opportunity to review and accept the required documents.

**Article 45. PROGRESS PAYMENTS AND RETENTION**

a. Cost Breakdown:

Prior to submitting Contractor's first request for payment, the Contractor shall prepare and submit to the Architect and District a cost breakdown (schedule of values) showing the major work items for each trade or operation required in construction of the Project. The work items shall be sufficiently detailed to enable the Architect to accurately evaluate the completion percentages requested by the Contractor. The cost for each work item shall include overhead and profit. The total of all work item costs shall equal the amount of the Contract.

b. Scope of Payment:

Payment to the Contractor at the unit price or other price fixed in the Contract for performing the work required under any item or at the lump sum price fixed in the Contract for performing all the work required under the Contract shall be full compensation for furnishing all labor, materials, equipment and tools

necessary to the work, and for performing and completing, in accordance with the Specifications, all work required under the item or under the Contract, and for all expense incurred by the Contractor for any purpose in connection with the performance and completion of the work.

c. Progress Payments:

The Contractor will, on or about the last day of each month, make an estimate of the value of the work completed by Contractor in the performance of the Contract. These estimates shall be subject to the review and approval of the Architect. The first such estimate will be of the value of the work completed after the Contractor commenced the performance of the Contract, and every subsequent estimate, except the final estimate, will be of the value of the work completed since the immediately preceding estimate. Such estimates will be based on labor, materials and equipment incorporated into the work, and items of materials and equipment delivered to the Project. The Contractor shall be responsible for the security and protection of such materials and equipment delivered to the Project and not incorporated in the work. Within thirty (30) calendar days after the approval of each estimate for progress payment, the District will pay to the Contractor an amount equal to ninety five (95) percent of the approved estimate, unless a different retention percentage is stated in the Notice to Bidders, in which case that percentage applies. Payments may at any time be withheld if in the judgment of the District the work is not proceeding in accordance with the Contract Documents, the Contractor is not complying with the requirements of the Contract, stop notices have been timely filed, the estimate contains an error, or the District has incurred costs or requests reasonable financial assurances regarding defective work by the Contractor.

d. Final Payment:

Within thirty (30) days after all required work is fully completed in accordance with the Contract Documents, the Contractor shall submit a final invoice for the total value of the work completed in accordance with the Contract, which shall be subject to review and approval by the District. As required by law, District shall pay Contractor the unpaid balance of the Contract price of the work, or the whole Contract price of the work if no progress payment has been made, determined in accordance with the terms of the Contract, less such sums as may be lawfully retained under any provision of the Contract, including, but not limited to, amounts retained as liquidated damages, for stop notices, for third-party claims for which the Contractor is required to indemnify the District, for defective work and costs incurred by the District in connection therewith, or for other such claims and damages attributable to the Contractor (“Final Payment”). Prior progress estimates and payments are subject to correction in the Final Payment. Tender of the Final Payment shall constitute denial by the District of any unresolved claim. Contractor’s acceptance of the Final Payment shall operate as a full and final release to the District and its agents from any and all unasserted claims Contractor has, or may have, related to this Contract. Pursuant to California Public Contract Code §7107, if there is any dispute between the District and the Contractor at the time that disbursement of the Final Payment is due, the District may withhold from disbursement of the Final Payment an amount not to exceed one hundred fifty percent (150%) of the amount in dispute.

e. Payments Do Not Imply Acceptance of Work:

The granting of any progress payment or payments by the District or the receipt thereof by the Contractor shall not constitute acceptance of the work or of any portion thereof, and shall in no way lessen the liability of the Contractor to replace unsatisfactory work or material, whether or not the unsatisfactory character of such work or material was apparent or detected at the time such payment was made.

f. Retention of Sums Charged Against Contractor:

It is mutually understood and agreed that when under any provision of this Contract, the District shall charge any sums of money against the Contractor, the amount of such charge shall be deducted and retained by the



District from the amount of the next succeeding progress estimate, or from any other monies due or that may become due the Contractor on account of the Contract. If on completion or termination of the Contract such monies due the Contractor are found insufficient to cover the District's charges against the Contractor, the District shall have the right to recover the balance from the Contractor or the Contractor's Sureties.

g. Release:

The Contractor and each assignee under an assignment in effect at the time of Final Payment shall, if required by the District, execute and deliver at the time of Final Payment and as a condition precedent to Final Payment, a release in form and substance satisfactory to and containing such exemptions as may be found appropriate by the District, discharging the District, its officers, agents and employees of and from liabilities, obligations and claims arising under this Contract.

h. Payment to Subcontractors and Suppliers:

The Contractor shall pay each Subcontractor and supplier promptly on receipt of each progress payment from the District for the materials, labor and equipment delivered to the site or incorporated in the work by each Subcontractor during the period for which the progress payment is made, less any retention as provided above.

i. Stop Notice Costs:

The District reserves the right to charge the Contractor or Surety, or to withhold from release of retention, all costs incurred by the District, including attorney's fees, for processing and defending stop notice claims.

j. Whenever any part of the Work is in a condition suitable for use, and the best interest of the District requires such use, the District may take possession of, connect to, open for public use, or use a part thereof. When so used, maintenance and repairs due to ordinary wear and tear or vandalism will be made at District's expense. The use by the District as contemplated in this section shall in no case be construed as constituting acceptance of the Work or any part thereof. Such use shall neither relieve the Contractor of any of his responsibilities under the Contract nor act as a waiver by the District of any of the conditions thereof. Contractor shall continue to maintain all insurance, including Builder's Risk insurance, on the Project.

**Article 46. PAYMENTS WITHHELD**

In addition to amounts which the District may retain under other provisions of the Contract Documents, the District may withhold payments due to Contractor as may be necessary to cover:

- a. Stop Payment Notice Claims.
- b. Defective work not remedied.
- c. Failure of Contractor to make proper payments to its subcontractors or suppliers.
- d. Completion of the Contract if there exists a reasonable doubt that the Work can be completed for balance then unpaid.
- e. Damage to another contractor or third party.
- f. Amounts which may be due the District for claims against Contractor.
- g. Failure of Contractor to keep the record ("as-built") drawings up to date.

- h. Failure to provide updates on the construction schedule.
- i. Site clean-up.
- j. Failure of the Contractor to comply with requirements of the Contract Documents.
- k. Liquidated damages.
- l. Legally permitted penalties.

Upon completion of the Contract, the District will reduce the final Contract amount to reflect costs charged to the Contractor, back charges or payments withheld pursuant to the Contract Documents.

District may apply such withheld amount or amounts to payment of such claims or obligations at its discretion. In so doing, District shall be deemed the agent of Contractor and any payment so made by District shall be considered as a payment made under the 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 obligations. District will render Contractor a proper accounting of such funds disbursed on behalf of Contractor.

**Article 47. CHANGES AND EXTRA WORK**

a. Changes in the Work:

- 1) The District, before the date of acceptance of the work, may, without notice to the Sureties, order changes in the work (“Modifications”), may order extra materials and extra work in connection with the performance of the Contract, and the Contractor shall promptly comply with such orders. All Modifications must be approved by DSA and the State Fire Marshall, if applicable, as required by law.
- 2) If changes ordered in design, workmanship or materials are of such a nature as to increase or decrease the cost of any part of the work, the price fixed in the Contract shall be increased or decreased by such amount as represents the reasonable and proper allowance for the increase or decrease in the cost of the work in accordance with the provisions of this Article, and any other applicable terms of the Contract, including, but not limited to, the Contractor’s schedule of values and the price for allowances, if any. Except as provided by law, the total cost of all Modifications shall not exceed ten (10) percent of the original Contract price.
- 3) In the case of a disputed work item, the District may direct the Contractor to perform the disputed work at no additional cost to the District on the grounds that the work is adequately indicated in the Contract Documents, and therefore already included in the Contract price. If the Contractor maintains that the disputed work represents a modification to the Contract, Contractor may submit a claim in accordance with Article 78, Dispute Resolution. Notwithstanding any dispute regarding the requirements of the Contract Documents, Contractor shall promptly and fully comply with the District’s directive. Contractor’s failure to do so shall be deemed a material breach of this Contract, and in addition to all other remedies, District may, at its sole discretion, hire another contractor and/or use its own forces to complete the disputed work at Contractor’s sole expense, and may deduct the cost of such work from the Contract price.

b. Cost Breakdown:

When the Modification is proposed, the Contractor shall furnish a complete breakdown of actual costs of both credits and extras, itemizing materials, labor, taxes, overhead and profit. Subcontract work shall be

so indicated. All costs must be fully documented. The following limitations shall apply:

1) Limitations Where Contract Price Changes are Involved:

- (a) Overhead and Profit for the Contractor. The Contractor's overhead and profit on the cost of subcontracts shall be a sum not exceeding ten percent (10%) of such costs. The Contractor's overhead and profit on the costs of work performed by the Contractor shall be a sum not exceeding fifteen percent (15%) of such costs. Overhead and profit shall not be applied to the cost of taxes and insurance by Contractor or Subcontractors or to credits. No processing or similar fees may be charged by the Contractor in connection with the Modification. "Overhead and profit" shall include all plant, equipment rental and repair, project management, field coordination, job site project supervision and indirect labor and materials.
- (b) Bond Premiums. The actual rate of bond premiums as paid on the total cost (including taxes) will be allowed, but with no markup for profit and overhead.
- (c) Taxes. State and city sales taxes should be indicated. Federal excise tax shall not be included. (District will issue an exemption on request.)

2) Change Order Certification:

All change orders and requests for proposed change orders shall be deemed to include the following certification by the Contractor:

"The undersigned Contractor approves the foregoing as to the changes in work, if any, and as to the Contract price specified for each item and as to the extension of time allowed, if any, for completion of the Project as stated herein, and agrees to furnish all labor, materials, and service and to perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of claims which have no basis in fact or which Contractor knows are false are made at the sole risk of the Contractor and may be a violation of the False Claims Act, as set forth in Government Code §§12650 et seq. It is understood that the changes to the Contract Documents set forth herein shall only be effective upon approval by the Board of Education of the District.

"It is expressly understood that the value of the extra work or changes 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 herein are deemed waived."

c. Unit Prices, Schedule of Values, or Allowances:

Where Unit Prices, a Schedule of Values, and/or Allowances are required by the Contract Documents, that pricing shall govern in computing any additions to or deductions from the Contract price on account of any added or omitted work. Unit Prices listed in the original bid include all costs and no addition of any description will be allowed.

d. Time and Materials:

If it is impractical, because of the nature of the work, or for any other reason, to fix an increase in price in advance, the Change Order may fix a maximum price which shall not under any circumstances be exceeded, and subject to such limitation, such alteration, modification or extra shall be paid for at the actual necessary cost as determined by the sum of the following items (1) to (5) inclusive:

- 1) Labor, including premium on compensation insurance and charge for Social Security taxes, and other taxes pertaining to labor.
- 2) Material, including sales taxes and other taxes pertaining to materials.
- 3) Plant and equipment rental, to be agreed upon in writing before the work is begun. No charge for the cost of repairs to plant or equipment will be allowed.
- 4) Overhead and profit computed at fifteen percent (15%) of the total of Items (1) to (3) inclusive.
- 5) The proportionate cost of premiums on bonds computed at one and one-half percent (1-1/2%) of the total of items (1) to (4) inclusive.

If the Time and Materials work is done by a Subcontractor, the amount shall be determined as set forth above under items (1) to (5) inclusive. The Contractor's overhead and profit on the costs of subcontracts (exclusive of taxes and insurance) shall not exceed ten percent (10%) of such costs.

The District reserves the right to furnish such materials as it may deem expedient, and no allowance will be made for profit thereon. The above-described methods of determining the payment for work and materials shall not apply to the performance of any work or the furnishing of any material which, in the judgment of the District, may properly be classified under items for which prices are established in the Contract.

e. Oral Modifications:

No oral statements of any person shall in any manner or degree modify or otherwise affect the terms of the Contract.

f. No dispute, disagreement or failure of the Parties to reach agreement on the terms of the change order shall relieve the Contractor from the obligation to proceed with performance of the Work, including extra work, promptly and expeditiously.

g. Any alterations, extensions of time, extra work or any other changes may be made without securing consent of the Contractor's surety or sureties.

**Article 48. DEDUCTIONS FOR UNCORRECTED WORK**

If District deems it inexpedient to correct work injured or not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore.

**Article 49. WARRANTY OF TITLE**

Contractor warrants that title to all work, materials or equipment included in a request for payment shall pass and transfer to the District whether or not they are installed or incorporated in the Project, free from any claims, liens or encumbrances, when such payment is made to the Contractor. Contractor further warrants that no such work, materials or equipment have been purchased for work under the Contract subject to an agreement by which an interest therein or an encumbrance thereon is retained by the seller or supplier.

**Article 50. CONTRACTOR'S SUPERVISION**

a. Unless personally present on the premises where the Work is being done, Contractor shall keep on the Work, during its progress, a competent full-time job (project) superintendent satisfactory to District. The job superintendent shall not be changed except with the written consent of the District unless the job

superintendent proves to be unsatisfactory to Contractor and ceases to be in his employ. The job superintendent shall represent Contractor in his absence and all directions given to him shall be as binding as if given to Contractor. Other directions shall be so confirmed on written request in each case.

- b. Contractor shall give efficient supervision to the Work, using his best skill and attention to control safety and job coordination. He shall carefully study and compare all drawings, specifications, and other instructions and shall at once report to District any error, inconsistency or omission which he may discover.

**Article 51. DOCUMENTS ON WORK**

- a. Contractor shall keep one copy of all Contract Documents, including addenda, change orders, Division I, Title 21 of the California Code of Regulations, Parts 1-5 and 12 of Title 24 of the California Code of Regulations, and the prevailing wage rates applicable at the time of the Contract, which are a part of Contract Documents, on the job at all times. Said documents shall be kept in good order and shall be available to the District and District representative. Contractor shall be acquainted with and comply with the provisions of said Titles 21 and 24 as they relate to this Project. (See particularly Duties of the Contractor, Title 24 California Code of Regulations, section 4-343.) Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to this project, particularly Titles 17, 19, 21 and 24.
- b. Contractor shall also make available all books, records, accounts, contracts, bids, etc. upon request by the District.

**Article 52. RECORD ("AS BUILT") DRAWINGS**

- a. Contractor shall maintain a clean, undamaged set of Contract drawings and shop drawings. In addition to maintaining one complete set of record drawings (herein referred to as "as-builts"), Contractor shall require each trade to do its own as-builts. The trade as-builts shall contain information showing clean and clear drawings with horizontal and vertical controls suitable for conversion to electronic media. Graphic quality must be equal to clean and clear original drawings; adequacy of the drawings shall be determined by the District's representative or the District. Contractor shall mark the set to show the actual installation where the installation varies from the Work as originally shown. Contractor shall mark whichever drawings are most capable of showing conditions fully and accurately where shop drawings are used, and shall record a cross-reference at the corresponding location on the Contract drawings. Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. Contractor shall use colors to distinguish variations in separate categories of the work.
- b. Contractor shall note related change order numbers where applicable. Contractor shall organize record drawings sheets into manageable sets, bound with durable paper cover sheets and shall print suitable title, dates and other identification on the cover of each set.
- c. At the end of the Project, the Contractor shall provide the District representative with a complete set of as-built drawings. The complete set shall contain information showing clean and clear drawings with horizontal and vertical controls suitable for conversion to electronic media. Graphic quality must be equal to clean and clear original drawings; adequacy of the drawings shall be determined by the District's representative or District. The as-builts must show the entire site for each major trade, including but not limited to water, sewer, electrical, data, telephone, cable, fire, alarm, gas, and plumbing.

**Article 53. UTILITY USAGE**

- a. All temporary utilities, including but not limited to electricity, water, gas, and telephone used on work shall be furnished and paid for by Contractor. Contractor shall furnish and install necessary temporary distribution systems, including meters, if necessary, from distribution points to points on site where utility is necessary to carry on the Work. Upon completion of the Work, Contractor shall remove all temporary distribution systems.
- b. Contractor shall provide necessary and adequate utilities and pay all costs for water, electricity, gas, oil, and sewer charges required for completion of the Project.
- c. All permanent meters installed shall be listed in the Contractor's name until completion occurs, as defined in Article 1 hereof, at which time further pro-rating will be determined if necessary. When the District begins using the Project, charges over and above power actually used for construction will be the responsibility of the District.
- d. If the Contract is for construction in existing facilities, Contractor may, with written permission of the District, use the District's existing utilities at no charge.

**Article 54. TRENCHING OR OTHER EXCAVATIONS**

- a. Excavations or Trenches Deeper than Four Feet:

If the Project involves digging trenches or other excavations that extend deeper than four feet, the following provisions shall be a part of this Contract:

- 1) The Contractor shall promptly, and before the following conditions are disturbed, provide written notice to the District if the Contractor finds any of the following conditions:
  - (a) Material that the Contractor believes may be a hazardous waste, as defined in §25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.
  - (b) Subsurface or latent physical conditions at the site which are different from those indicated or expected.
  - (c) Unknown physical conditions at the site of any unusual nature or which are materially different from those ordinarily encountered and generally recognized as inherent in work which the Contractor generally performs.
- 2) In the event that the Contractor notifies the District that Contractor has found any of the conditions specified in subparagraphs (a), (b) or (c), above, the District shall promptly investigate the condition(s). If the District finds that the conditions are materially different or that a hazardous waste is present at the site which will affect the Contractor's cost of, or the time required for, performance of the Contract, the District shall issue a change order in accordance with the procedures set forth in this Contract.
- 3) In the event that a dispute arises between the District and the Contractor regarding any of the matters specified in Paragraph (2), above, the Contractor shall proceed with all work to be performed under the Contract and the Contractor shall not be excused from completing the Project as provided in the Contract. In performing the work pursuant to this Paragraph, the Contractor retains all rights provided by Article 78 which pertains to the resolution of disputes between the

contracting Parties.

b. Regional Notification Center:

The Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area that 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. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages or delays arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor and shall not be considered for an extension of the Contract time.

c. Existing Utility Lines:

- 1) Pursuant to Government Code §4215, the District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction site at the time of commencement of construction under this Contract with respect to any such utility facilities that are not identified in the plans and Specifications. Contractor shall not be assessed liquidated damages for delay in completion of the Project caused by the failure of the District or the owner of a utility to provide for removal or relocation of such utility facilities.
- 2) Locations of existing utilities provided by the District shall not be considered exact, but approximate within reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care nor costs of repair due to Contractor's failure to do so. The District shall compensate Contractor for the costs of locating and repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and Specifications with reasonable accuracy.
- 3) No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Project. Nothing in this section shall be deemed to require the District to indicate the presence of existing service laterals, appurtenances, or other utility lines, with the exception of main or trunk lines, whenever the presence of such utilities on the site of the construction Project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction.
- 4) If Contractor, while performing work under this Contract, discovers utility facilities not identified by the District in the Project plans and Specifications, Contractor shall immediately notify the District and the utility in writing. The cost of repair for damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the Contractor.

d. Prompt Notification:

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the conditions. Accordingly, failure of Contractor to promptly notify the District in writing, pursuant to these provisions, shall constitute Contractor's waiver of any claim for damages incurred as a result of the conditions.

e. Trenches Five Feet and Deeper:

Pursuant to Labor Code §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 excavation, promptly submit to the District and/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.

**Article 55. PROTECTION OF WORK AND PROPERTY**

- a. The Contractor shall be responsible for all damages to persons or property that occur as a result of his fault or negligence arising from or in connection with the prosecution of this Contract. Contractor shall 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. Contractor shall adequately protect adjacent property from settlement or loss of lateral support as provided by law and the Contract Documents. Contractor shall take all necessary precautions for the safety of employees on the project and shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where work is being performed. Contractor shall erect and properly maintain at all times, as required by conditions and progress of work, all necessary safeguards, signs, 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 his organization on the Work, whose duty shall be prevention of accidents. The name and position of the person so designated shall be reported to the District by Contractor.
- b. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization from the District, is hereby permitted to act, at his discretion, to prevent such threatened loss or injury, and he shall so act, without appeal, if so authorized or instructed by the District. Any compensation claimed by Contractor on account of emergency work shall be determined by agreement.
- c. Contractor shall provide such heat, covering, and enclosures as are necessary to protect all work, materials, equipment, appliances, and tools against damage by weather conditions.
- d. Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, adjoining property, and structures, and to avoid damage thereto, and repair any damage thereto caused by construction operations. Contractor shall:
1. Enclose the working area with a substantial barricade, arrange work to cause minimum amount of inconvenience and danger to students and faculty in their regular school activities, and perform work which so as to not interfere with school routine before or after school hours. (This subsection applies to new construction on existing sites.)
  2. Provide substantial barricades around any shrubs or trees indicated to be preserved.
  3. Deliver materials to the building area over a route designated by the District.
  4. When directed by the District, take preventive measures to eliminate objectionable dust.
  5. Confine Contractor's apparatus, the storage of materials, and the operations of his workers to limits indicated by law, ordinances, permits, or directions of District. Contractor shall not unreasonably encumber the premises with his materials. Contractor shall enforce all instructions of the District



regarding signs, advertising, fires, danger signals, barricades, and smoking and require that all persons employed on work comply with all regulations while on the construction site.

6. 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 civil engineer or land surveyor, licensed in the State of California, at no cost to the District.

**Article 56. LAYOUT AND FIELD ENGINEERING**

All field engineering required for laying out this work and establishing grades for earthwork operations shall be furnished by the Contractor at his expense. Such work shall be done by a qualified civil engineer or land surveyor licensed in California and approved by the District. Any required "as-built" drawings of site development shall be prepared by the a qualified civil engineer or land surveyor licensed in California and approved by the District.

**Article 57. HAZARDOUS MATERIALS**

Unless otherwise specified, this Contract does not include the removal, handling, or disturbance of any hazardous substances or materials encountered in the new construction or on the Project grounds. If such substances or materials are encountered, work shall cease in that area and the District shall be promptly notified to take appropriate action for removal or otherwise abating the condition in accordance with current regulations applicable to the District.

a. General:

- 1) No asbestos, asbestos-containing products or other hazardous materials shall be used in this construction or in any tools, devices, clothing or equipment used to further this construction.
- 2) Asbestos and/or asbestos containing products shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremo-lite or actinolite.
- 3) Any or all material containing greater than one tenth of one percent (>.1%) asbestos shall be defined as asbestos-containing material.
- 4) Any disputes involving the question of whether or not material contains asbestos shall be settled by electron microscopy; the cost of any such tests shall be paid by the Contractor.
- 5) All work or materials found to contain asbestos or work or material installed with asbestos containing equipment will be immediately rejected and this work shall be removed by the Contractor at no additional cost to the District.

b. Decontamination and Removal of Hazardous Material from Prior Work:

- 1) Decontamination and removal of work found to contain asbestos or work installed with asbestos containing equipment shall be done only under the supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency ("EPA").
- 2) The asbestos removal contractor shall be an EPA-accredited contractor qualified in the removal of asbestos subject to the approval of the District.
- 3) The asbestos consultant shall be chosen and approved by the District which shall have sole discretion and final determination in this matter.

- 4) The work will not be accepted until asbestos contamination is reduced to levels deemed acceptable by the asbestos consultant.

c. Hold Harmless:

- 1) Interface of work under this Contract with work containing asbestos shall be executed by the Contractor at Contractor's risk and at Contractor's 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, as set forth in the indemnity provisions of this Contract, the Owner, its employees, agents and assigns for all asbestos liability which may be associated with this work and agrees to instruct Contractor's employees and agents with respect to the above-mentioned standards, hazards, risks and liabilities.
- 2) The Contractor shall, prior to commencement of this work, provide a duly signed and notarized affidavit that Contractor has instructed Contractor's employees and agents with respect to the above mentioned standards, hazards, risks and liabilities and the contents and requirements of this portion of the Contract Documents.

d. Certification:

The Contractor agrees that materials containing asbestos or other hazardous materials as defined in Federal and State law shall not be used in construction.

**Article 58. TEMPORARY FACILITIES**

- a. The Contractor shall obtain permits for, install and maintain in safe condition all scaffolds, hoisting equipment, barricades, walkways, or other temporary structures that may be required to accomplish the work. Such structures shall be adequate for the intended use and capable of safely accepting all loads that may be imposed upon them. They shall be installed and maintained in accordance with all applicable codes and regulations.
- b. The Contractor shall provide and maintain temporary heat from an approved source whenever in the course of the work it may become necessary for curing, drying or warming spaces as may be required for the proper installation of materials or finishes. The Contractor shall provide and maintain any and all facilities that may be required for dewatering in order that work may proceed on the Project. If it is necessary for dewatering to occur continually, the Contractor shall have on hand whatever spare parts or equipment that may be required to avoid interruption of service or work.
- c. The Contractor shall promptly remove all such temporary facilities when they are no longer needed for the work or on completion of the Project. The Contractor shall repair any damage to premises or property which resulted from the construction, use, or removal of temporary facilities

**Article 59. SANITARY FACILITIES**

Contractor shall provide sanitary temporary toilet buildings for the use of all workers. All toilets shall comply with local codes and ordinances. Toilets shall be kept supplied with toilet paper and shall have workable door fasteners. Toilets shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers as required by CAL-OSHA regulation. The toilets shall be maintained in a sanitary condition at all times. Use of toilet facilities in The Work under construction shall not be permitted. Any other sanitary facilities required by CAL-OSHA shall be the responsibility of the Contractor.

**Article 60. USE OF ROADWAYS AND WALKWAYS**

The Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic by any party entitled to use it. Wherever such interference becomes necessary for the proper and convenient performance of the work and no satisfactory detour route exists, the Contractor shall, before beginning the interference, provide a satisfactory detour, temporary bridge, or other proper facility for traffic to pass around or over the interference and shall maintain it in satisfactory condition as long as the interference continues, all without extra payment unless otherwise expressly stipulated in the Contract Documents.

**Article 61. SIGNS**

No signs may be displayed on or about the District's property (except those which may be required by law) without the District's prior written approval of size, content and location. Any signs required by the District will be designated in the Special Conditions.

**Article 62. CUTTING AND PATCHING**

- a. Contractor shall do all cutting, fitting, or patching of work as required to make its several parts come together properly and fit it to receive or be received by work of other contractors showing upon, or reasonably implied by, the drawings and specifications for the completed structure. Contractor shall make good after them as District may direct.
- b. All cost caused by defective or ill-timed work shall be borne by Party responsible therefore.
- c. Contractor shall not endanger any work by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor save with consent or at the direction of the District.

**Article 63. CLEANING UP**

- a. Contractor at all times shall keep premises free from debris such as waste, rubbish, and excess materials and equipment caused by this Work. Contractor shall not leave debris under, in, or about the premises. Upon completion of the Work, Contractor shall clean the interior and exterior of the building or improvement 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. Contractor shall clean and polish all glass, plumbing fixtures, and finish hardware and similar finish surfaces and equipment and contractor shall also remove temporary fencing, barricades, planking and construction toilet and similar temporary facilities from the site.
- b. Final cleaning, such as sweeping, dusting, vacuuming, dry and wet mopping, polishing, sealing, waxing and other finish operations normally required on newly installed work shall be taken to indicate the finished conditions of the various new and existing surfaces at the time of acceptance. Prior to the time of acceptance, all marks, stains, fingerprints, dust, dirt, splattered paint and blemishes resulting from the various operations shall be removed throughout the Project. Stair treads and risers shall be wet-mopped. Glass shall be left clean and polished both inside and outside. Plumbing fixtures and light fixtures shall be washed clean. Hardware and other unpainted metals shall be cleaned and all building papers and other temporary protections shall be removed throughout the building, or portion of the building where Contractor was involved, all to the satisfaction of the Architect and District. The exterior of the buildings, playfields, exterior improvements, and planting spaces and other work areas shall be similarly clean and in good order. See Special Conditions for additional requirements and instructions.

**Article 64. CORRECTION OF WORK BEFORE FINAL PAYMENT**

- a. Contractor shall promptly remove from the premises all Work condemned by District as failing to conform to the Contract Documents, whether incorporated or not. Contractor shall promptly replace and re-execute his own Work to comply with contract documents without additional expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.
- b. If Contractor does not remove such condemned Work 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) days' time thereafter, District may, upon ten (10) 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.

**Article 65. ACCESS TO WORK**

District and its representatives shall at all times have access to the Work wherever it is in preparation or progress. Contractor shall provide safe and proper facilities for such access so that the District's representatives may perform their functions under the Contract.

**Article 66. OCCUPANCY**

District reserves the right to occupy buildings at any time before completion, and such occupancy shall not constitute final acceptance of any part of the Work covered by this Contract.

**Article 67. DISTRICT'S INSPECTOR**

- a. If applicable, an inspector will be employed by District in accordance with requirements of Title 24 of the California Code of Regulations and will be assigned to the work. The inspector's duties are specifically defined in Part 1, Title 24, Section 4-342 of the California Code of Regulations.
- b. All work shall be under the observation of said inspector. The inspector shall have free access to any or all parts of work at any time. Contractor shall furnish inspector reasonable facilities for obtaining such information as may be necessary to keep the inspector fully informed respecting progress and manner of Work and character of materials, including assisting with Inspector's monthly reports. Inspection of Work shall not relieve Contractor from any obligation to fulfill this contract. Inspector or District shall have authority to stop Work whenever the provisions of the Contract Documents are not being complied with and Contractor shall instruct the Contractor's employees accordingly.

**Article 68. TESTS AND INSPECTIONS**

- a. If the Contract Documents, the District Representative, or any instructions, laws, ordinances, or public authority require any part of the Work to be tested or approved, Contractor shall provide the District Representative at least two (2) working days' notice of its readiness for observation or inspection. If inspection is by a public authority other than the District, Contractor shall promptly inform the District of the date fixed for such inspection. Required certificates of inspection (or similar) shall be secured by Contractor. Costs for District testing and District inspection shall be paid by the District. Costs of tests for Work found not to be in compliance shall be paid by the Contractor.
- b. If any Work is done or covered up without the required testing or approval, the Contractor shall uncover or deconstruct the Work, and the Work shall be redone after completion of the testing at the Contractor's cost in compliance with the Contract Documents.

- c. Where inspection and testing are to be conducted by an independent laboratory or agency, materials or samples of materials to be inspected or tested shall be selected by such laboratory or agency, or by the District, and not by Contractor. All tests or inspections of materials shall be made in accordance with the commonly recognized standards of national organizations.
- d. In advance of the manufacturing of materials to be supplied by Contractor which must be tested or inspected, Contractor shall notify the District so that the District may arrange for testing at the source of supply. Any materials which have not satisfactorily passed such testing and inspection shall not be incorporated into the Work.
- e. If the manufacturing of materials to be inspected or tested will occur in a plant or location outside the geographic limits of District, the Contractor shall pay for any excessive or unusual costs associated with such testing or inspection, including but not limited to excessive travel time, standby time and required lodging.
- f. Reexamination of the Work may be ordered by the District. If so ordered, the Work must be uncovered or deconstructed by Contractor. If the Work is found to be in accordance with the Contract Documents, the District shall pay the costs of reexamination and reconstruction. If such Work is found not to be in accordance with the Contract Documents, Contractor shall pay all costs.
- g. Inspection and testing by the District or its representatives shall not relieve the Contractor from complying with the requirements of the Contract Documents. The Contractor is responsible for its own quality control.

**Article 69. SOILS INVESTIGATION REPORT**

- a. Soil Report: Unless otherwise specifically provided, when a soils investigation report obtained from test holes at the site is available, such report shall not be a part of this Contract. Nevertheless, with respect to any such soils investigation and/or geotechnical report regarding the site, it shall be the responsibility of the Contractor to review and be familiar with such report. Any information obtained from such report or any information given on drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, and does not form a part of the Contract, unless otherwise specifically provided.
- b. Underground Investigation: Contractor is required to make a visual examination of site and must make whatever tests he deems appropriate to determine the underground condition of the soil. Limited soil tests and subsurface investigations, if any, are available for review and consideration by Contractor and were conducted for the purpose of design only. Subsurface investigation information is made available by District solely as a matter of convenience and general information for Contractor and Contractor is expected to review and be familiar with such information. No representation is made by the District or its representatives that information provided is completely representative of all conditions and materials which may be encountered. If such a report is referenced in the Contract Documents for performance of the Work, such reference shall be to establish minimum requirements only.
- c. No Representations: No representation is made by the District or its representatives that information provided is solely adequate for purposes of construction. District disclaims responsibility for interpretations by Contractor of soil and subsurface investigation information, such as in protecting soil-bearing values, rock profiles, presence and scope of boulders and cobbles, soil stability and the presence, level and extent of underground water. Contractor shall determine the means, methods, techniques and sequences necessary to achieve required characteristics of completed Work. Conditions found after execution of the Agreement to be materially different from those reported and which are not customarily encountered in the geographic area of the Work shall be governed by provisions of the General Conditions of the Contract for unforeseen conditions.

**Article 70. DISTRICT'S STATUS**

- a. In general and where appropriate and applicable, the District's [Insert appropriate District Staff e.g. Executive Director of Facilities, Maintenance and Operations], shall be the District's representative during the construction period and shall observe the progress and quality of the Work on behalf of the District. He or she shall have the authority to act on behalf of District only to the extent expressly provided in the Contract Documents. After consultation with the Inspector and after using his best efforts to consult with the District, the District shall have authority to stop work whenever such stoppage may be necessary in his reasonable opinion to insure the proper execution of the Contract Documents.
- b. Contractor further acknowledges that the District shall be, in the first instance, the judge of the performance of this Contract.

**Article 71. PROVISIONS REQUIRED BY LAW DEEMED INSERTED**

Each and every provision of law and clause 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, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon application of either Party, the Contract shall forthwith be physically amended to make such insertion or correction.

**Article 72. LABOR/EMPLOYMENT SAFETY**

The Contractor shall maintain emergency first aid treatment for his employees which complies with the Federal Occupational Safety and Health Act of 1970 (29 USC, section 651 et seq.).

**Article 73. ASSIGNMENT OF ANTITRUST ACTIONS**

Pursuant to Public Contract Code Section 7103.5, 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 USC, section 15) or under the Cartwright Act (chapter 2 (commencing with section 16700) of part 2 of division 7 of the Business and Professions Code), arising from the purchase of goods, services, or materials pursuant to this Contract or any subcontract. This assignment shall be made and become effective at the time the District tenders final payment to the Contractor, without further acknowledgment by the Parties.

**Article 74. SUBSTITUTION OF SECURITY**

- a. Upon the Contractor's request, the District will make payment of funds withheld from progress payments to ensure performance under the Contract pursuant to the requirements of Public Contract Code section 22300 if the Contractor deposits in escrow with the District or with a bank acceptable to the District, securities eligible for investment under Government Code section 16430, bank or savings and loan certificates of deposit, or other security mutually agreed to by the Contractor and the District, subject to the following conditions:
  - 1. The Contractor shall bear the expense of the District and the escrow agent, either the District or the bank, in connection with the escrow deposit made.
  - 2. Securities or certificates of deposit to be placed in escrow shall be of a value at least equivalent to the amounts of retention to be paid to the Contractor pursuant to this section.
  - 3. The Contractor shall enter into an escrow agreement satisfactory to the District, which agreement shall include provisions governing inter alia:

- (a) The amount of securities to be deposited,
  - (b) The providing of powers of attorney or other documents necessary for the transfer of the securities to be deposited,
  - (c) Conversion to cash to provide funds to meet defaults by the Contractor, including, but not limited to, termination of the Contractor's control over the work, stop payment notices filed pursuant to law, assessment of liquidated damages or other amounts to be kept or retained under the provisions of the contract,
  - (d) Decrease in value of securities on deposit,
  - (e) The termination of the escrow upon completion of the contract.
4. The Contractor shall obtain the written consent of the surety to such agreement.
5. As an alternative to Contractor depositing into escrow securities of a value equivalent to the amounts of retention to be paid to the Contractor, upon Contractor's request, District will make payment of retentions earned directly to the escrow agent at the expense of Contractor pursuant to and in accordance with Public Contract Code section 22300.

**Article 75. COMPLIANCE WITH STATE STORM WATER PERMIT FOR CONSTRUCTION**

- a. The Contractor shall be required to comply with all conditions of the State Water Resources Control Board (State Water Board) National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity (Permit) for all construction activity which results in the disturbance of in excess of one acre of total land area or which is part of a larger common area of development or sale. The Contractor shall be responsible for filing the Notice of Intent and for obtaining the Permit. The Contractor shall be solely responsible for preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) prior to initiating Work. It shall be Contractor's responsibility to evaluate the cost of compliance with the SWPPP in bidding on this Contract. Contractor shall comply with all requirements of the State Water Resources Control Board. Contractor shall include all costs of compliance with specified requirements in the Contract amount.
- b. Contractor shall be responsible for implementing and complying with the provisions of the Permit and the SWPPP, including the standard provisions, monitoring and reporting requirements as required by the Permit. Contractor shall provide copies of all reports and monitoring information to the District.
- c. Contractor shall comply with the lawful requirements of any applicable municipality, the County, drainage district, and other local agencies regarding discharges of storm water to separate storm drain system or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.
- d. Failure to comply with the Permit is a violation of federal and state law. Contractor hereby agrees to indemnify and hold harmless the District, its Board members, officers, agents, employees and authorized volunteers from and against any and all claims, demands, losses or liabilities of any kind or nature which District, its Board members, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit arising out of or in connection with the Project, except for liability resulting from the negligence or willful misconduct of the District, its Board members, officers, agents, employees

or authorized volunteers. District may seek damages from Contractor for delay in completing the Contract caused by Contractor's failure to comply with the Permit.

**Article 76. RECORD KEEPING**

- a. The Contractor agrees to comply with Labor Code §§ 1776 and 1812. The Contractor and each Subcontractor shall keep or cause to be kept an accurate record showing the names, addresses, social security numbers, work classifications, straight time and overtime hours worked each day and week of all workers employed by Contractor in connection with the execution of this Contract or any subcontract thereunder and showing the actual per diem wages paid to each of such workers. These records shall be certified; shall be submitted electronically at least monthly to the Chief of the Division of Labor Standards Enforcement of the Department of Industrial Relations; and shall be open at all reasonable hours to the inspection of the District awarding the Contract, its officers and agents, and to the Chief of the Division of Labor Standards Enforcement of the Department of Industrial Relations, and his or her other deputies and agents.
- b. In addition, copies of the above records shall be available as follows:
  - 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 the District, the Division of Labor Standards Enforcement, and 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 copies thereof made; provided, however, that a request by the public shall be made through either the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been previously provided, the requesting party shall, prior to being provided the records, reimburse the costs of the Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the Contractor.
- c. The Contractor shall file a certified copy of the records with the entity requesting the records within ten days after receipt of a written request. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District, shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor awarded the Contract or performing the Contract shall not be marked or obliterated.
- d. The Contractor shall inform the District of the location of the records, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.
- e. In the event of noncompliance with the requirements of this section, the Contractor shall have ten days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this section. Should noncompliance still be evident after the ten day period, the Contractor shall, as a penalty to the District, forfeit one hundred dollars (\$100) 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.
- f. Responsibility for compliance with this provision shall be with the Contractor.



**Article 77. PROJECT COMPLETION**

- a. When all of the work to be performed under this Contract has been fully completed, the Contractor shall notify the Architect and District, in writing, setting a date for inspection. The Contractor and Subcontractor representatives shall attend the inspection. As a result of this inspection, the Architect will prepare a list of items (“punch list”) that are incomplete or not installed according to the Contract Documents. Failure to include items on this list does not relieve the Contractor from fulfilling all requirements of the Contract Documents.
- b. The Architect will promptly deliver the punch list to the Contractor and it will include a period of time by which the Contractor shall complete all items listed thereon. On completion of all items on the punch list, verified by a final inspection, and all other Contract requirements, so that Final Completion has been achieved to the District’s satisfaction, the District will file a Notice of Completion with the County Recorder. Payment of retention from the Contract, less any sums withheld pursuant to the terms of this Contract or applicable law, shall not be made sooner than thirty-five (35) calendar days after the date of filing of Notice of Completion. Contractor shall perform all tasks necessary to obtain Project certification from the authority having jurisdiction over the Project. Final Completion shall not occur until Contractor has delivered evidence of final Project certification to the District.
- c. District reserves the right to occupy buildings and/or portions of the site at any time before Final Completion, and occupancy shall not constitute final acceptance of any part of the Work covered by the Contract Documents, nor shall such occupancy extend the date specified for completion of the Work. Beneficial occupancy of building(s) does not commence any warranty period or entitle Contractor to any additional compensation due to such occupancy, or affect in any way or amount Contractor’s obligation to pay liquidated damages for failure to complete the Project on time.

**Article 78. DISPUTE RESOLUTION**

- a. Disputes; Continuation of Work. Notwithstanding any claim, dispute or other disagreement between the District and the Contractor regarding performance under the Contract Documents, the scope of Work thereunder, or any other matter arising out of or related to, in any manner, the Contract Documents, the Contractor shall proceed diligently with performance of the Work in accordance with the District’s written direction, pending any final determination or decision regarding any such claim, dispute or disagreement.
- b. Dispute/Claims Resolution.
  - 1. Contractor Continuation of Work. Notwithstanding any claim, dispute, disagreement or other matter in controversy between the District and the Contractor relating to the Contract Documents and/or the Work, the Contractor shall continue to diligently prosecute and perform the Work in accordance with requirements of the Contract Documents, pending any final determination or decision regarding any such claim, dispute, disagreement or matter in controversy.
  - 2. Public Contract Code § 9204 Claims Resolution Procedures. Claims of the Contractor are subject to the non-binding dispute resolution procedures set forth in Public Contract Code § 9204 (“Section 9204”) provided, however, that the Contractor’s initiation of Section 9204 procedures is expressly subject to the Contractor’s prior full and timely compliance with requirements and procedures of the Contract Documents relating to procedures for resolution of claims, change orders, disputes and other matters in controversy under the Contract Documents.
  - 3. Claim Defined. The term “Claim” shall be as defined in Section 9204.
  - 4. Claim Documentation. The Contractor shall furnish reasonable documentation to support each Claim. “Reasonable documentation” includes, without limitation: (i) contractual and legal

basis establishing Claim entitlement or merit; (ii) factual basis establishing District liability for the Claim; (iii) detailed breakdown of labor, materials, equipment and other costs included in the Claim; and (iv) detailed basis, including Construction Schedule analysis and fragnets supporting any Contract Time adjustment or Liquidated Damages relief included in the scope of a Claim.

5. District Claim Review Statement. Within forty-five (45) days (or such other time mutually agreed to by the District and the Contractor) after receipt of a properly submitted and properly documented Claim, the District will conduct a reasonable review of the Claim and provide the Contractor with a written statement identifying the disputed and undisputed portions of the Claim (“Claim Review Statement”). If the District does not provide the Contractor with the Claim Review Statement for any Claim within forty-five (45) days (or other time mutually agreed to by the District and the Contractor) after receipt of a properly submitted and properly documented Claim, the Claim is deemed rejected in its entirety and thereupon, the Contractor may initiate the Meet and Confer process described below. A Claim deemed rejected pursuant to the foregoing does not constitute an adverse finding of Claim merit or the Contractor’s responsibility or qualifications. If the Claim Review Statement identifies any undisputed portion of a Claim (“Undisputed Claim”) and payment is due from the District on the Undisputed Claim, the District shall process and make payment on the Undisputed Claim within sixty (60) days after the issuance date of the Claim Review Statement.

6. Meet and Confer.

(a) Meet and Confer Demand. If the Contractor disputes any portion of the Claim Review Statement, or if a Claim is deemed rejected by the District not providing the Contractor with the Claim Review Statement within the time permitted under Section 9204, the Contractor may demand an informal conference to meet and confer with the District for settlement of the issues in dispute (“Meet and Confer”). The Contractor’s Meet and Confer request must be submitted to the District: (i) in writing; (ii) by registered mail or certified mail, return receipt requested; and (iii) within ten (10) days after the Claim Review Statement is submitted to the Contractor or within ten (10) days after the date the Claim is deemed rejected, as applicable. Failure of the Contractor to strictly comply with the foregoing is deemed a waiver of the Contractor’s right to request the Meet and Confer and the Non-Binding Mediation procedures under Section 9204. If the Contractor strictly complies with the foregoing, the District will schedule the Meet and Confer conference within thirty (30) days of the Contractor’s Meet and Confer request for settlement of disputed portions of the Claim Review Statement.

(b) Meet and Confer Statement. Within ten (10) business days after conclusion of the Meet and Confer conference, if any portion of a Claim remains disputed, the District shall provide the Contractor a written statement identifying the disputed and undisputed portions of the Claim (“Meet and Confer Statement”). If the Meet and Confer Statement identifies any Undisputed Claim and payment is due from the District on the Undisputed Claim, the District shall process and make payment on the Undisputed Claim within sixty (60) days after date the Meet and Confer Statement is issued.

7. Non-Binding Mediation.

(a) Contractor Initiation. The Contractor may request nonbinding mediation (“Mediation”) of disputed portions of a Claim identified in the Meet and Confer Statement. The Contractor’s Mediation demand must be submitted to the District: (i) in writing; (ii) by registered mail or certified mail, return receipt requested; (iii) within ten (10) days after the Meet and Confer Statement is submitted to the Contractor; and (iv) with specific identification of the disputed Claims issues

subject to Mediation. Failure of the Contractor to strictly comply with the foregoing is deemed a waiver of the Contractor's right to demand Mediation procedures under Section 9204.

(b) Mediator Selection. The District and Contractor shall mutually agree to a mediator within ten (10) business days after the date of the Contractor's demand for Mediation. If the District and Contractor do not mutually agree to a mediator, the District and Contractor shall each select a mediator and the District/Contractor selected mediators shall select a qualified neutral third party to mediate the disputed portion of the Claim.

(c) Mediation Procedures. 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 District and Contractor in dispute resolution through negotiation or by issuance of an evaluation.

(d) Mediation Costs. All costs, fees and expenses of the mediator(s) and mediation administration shall be shared equally by the District and Contractor. The foregoing notwithstanding, the Contractor and District shall each bear the costs, fees and expenses of their own attorneys, experts and consultants.

(e) Post-Mediation Disputed Claims. Any Claims or issues in dispute after Mediation shall be resolved in accordance with the applicable provisions of the Contract Documents.

(f) Waiver. The District and Contractor may mutually agree to waive, in writing, Mediation under Section 9204 and, subject to the Contractor's compliance with Government Code Claim requirements, proceed directly to commencement of a civil action or binding arbitration.

8) Payments of Undisputed Claims. If a payment due from the District for Undisputed Claims identified in the Claim Review Statement or the Meet and Confer Statement issued for a Claim is not made within the time established under Section 9204 the overdue portion of such payment shall bear interest at the rate of seven percent (7%) per annum from the date due. The District's credit application of any amount due for an Undisputed Claim against amounts due from the Contractor under the Contract Documents shall be deemed payment of the Undisputed Claim.

9) Subcontractor Claims.

(a) Subcontractor Claim Submittal. If a Subcontractor, of any tier (collectively referred to as "Subcontractor" in this Article) lacks legal standing to assert a Claim against the District because privity of contract does not exist, the Contractor may present the District a Claim on behalf of the Subcontractor ("Subcontractor Claim"). Each Subcontractor requesting submittal of a Subcontractor Claim to the District shall furnish reasonable documentation to support the Subcontractor Claim. Within forty-five (45) days of receipt of a Subcontractor's written request to submit a Subcontractor Claim, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the Subcontractor Claim to the District. If the Contractor did not present the Subcontractor Claim, the Contractor shall provide the Subcontractor with a statement of the reasons for not having done so.

(b) Contractor Certification of Subcontractor Claim. The District's review of Subcontractor Claims is expressly subject to the Contractor's submittal of a duly completed and executed form of Contractor Certification of Subcontractor Claim

certifying that the Contractor has thoroughly reviewed the Subcontractor Claim and based on the Contractor's review, certify that: (i) the Subcontractor Claim is made by the Subcontractor in good faith; (ii) the Subcontractor Claim is supported by reasonable documentation establishing entitlement to the relief requested and District liability therefor; and (iii) the Subcontractor Claim does not incorporate any request constituting a False Claim under applicable law, including the California False Claim Act (Government Code § 12650 et seq). The form of Contractor Certification of Subcontractor Claim is included in the Contract Documents.

c. District Review of Subcontractor Claim. Subcontractor Claims presented by the Contractor to the District are subject to the Section 9204 non-binding dispute resolution procedures set forth above, as modified herein. Requests for the District to conduct Meet and Confer and/or non-binding mediation procedures must be submitted jointly by the Contractor and the Subcontractor submitting the Subcontractor Claim. If Mediation proceedings are initiated in connection with a Subcontractor Claim, mediator and mediation administration fees and costs shall be borne equally by the District, Contractor and Subcontractor.

d. Disputed Subcontractor Claims. Subcontractor Claims which are not fully resolved by the Section 9204 non-binding dispute resolution procedures shall be resolved by Public Contract Code Section 20104.4 Dispute Resolution Procedures or binding arbitration, as applicable. Commencement of Section 20104.4 Dispute Resolution Procedures or binding arbitration proceedings in connection with any Subcontractor Claim is subject to compliance with Government Code Claims requirements.

10) Government Code Claim Requirements. Pursuant to Government Code § 930.6, any claim, demand, dispute, disagreement or other matter in controversy asserted by the Contractor, whether on behalf of itself or a Subcontractor, against the District for money or damages, including without limitation Claims or portions thereof remaining in dispute after completion of the Section 9204 non-binding dispute resolution procedures described above are deemed a "suit for money or damages" and shall be subject to the provisions of Government Code §§ 945.4, 945.6 and 946 ("Government Code Claims Process"). An express condition precedent to the Contractor's initiation of Section 20104.4 Dispute Resolution Procedures or binding arbitration proceedings pursuant to the following is the Contractor's compliance with the Government Code Claims Process, including without limitation, presentation of the claim, demand, dispute, disagreement or other matter in controversy between the Contractor and the District seeking money or damages to the District and acted upon or deemed rejected by the District in accordance with Government Code § 900 et seq.

c. Binding Arbitration of Claims.

1) JAMS Arbitration. Any Claim, or portion thereof in dispute after completion of the Section 9204 procedures and the Government Code Claims Process and any other claims, disputes, disagreements or other matters in controversy between the District and the Contractor arising out of, or related, in any manner, to the Contract Documents, or the interpretation, clarification or enforcement thereof shall be resolved by binding arbitration conducted before one (1) retired judge in accordance with the Construction Arbitration Rules and Procedures of Judicial Arbitration Mediation Services ("JAMS") in effect as of the date that a Demand for Arbitration is filed, except as expressly modified herein. The locale for any arbitration commenced hereunder shall be the regional office of the JAMS closest to the Site.

2) Demand for Arbitration. A Demand for Arbitration shall be filed and served within a reasonable time after the occurrence of the claim, dispute or other disagreement giving rise to the Demand for Arbitration, but in no event shall a Demand for Arbitration be filed or served after the date when the institution of legal or equitable proceedings based upon such claim, dispute or other disagreement would be barred by the applicable statute of limitations. If more than one Demand for Arbitration is filed by either the District or the Contractor relating to the Work or the Contract Documents, all Demands for Arbitration shall be consolidated into a single arbitration proceeding, unless otherwise agreed to by the District and the Contractor. The Contractor's Surety, a Subcontractor or Material Supplier to the Contractor and other third parties may in the District's sole discretion be joined in and bound by an arbitration commenced hereunder if required by the terms of their respective agreements with the Contractor or the District..

District may, in its sole discretion, join other defendants into the same arbitration proceeding (including without limitation, architects or construction managers) where the claims relate to the same project.

3) Discovery. In connection with any arbitration proceeding commenced hereunder, the discovery rights and procedures provided for in California Code of Civil Procedure § 1283.05 shall be applicable, and the same shall be deemed incorporated herein by this reference.

4) Arbitration Award. The award rendered by the Arbitrator ("Arbitration Award") shall be final and binding upon the District and the Contractor only if the Arbitration Award is: (i) supported by substantial evidence; (ii) based on applicable legal standards in effect that the time the Arbitration Award is issued; and (iii) supported by written findings of fact and conclusions of law in conformity with California Code of Civil Procedure § 1296. Any Arbitration Award that does not conform to the foregoing is invalid and unenforceable. The District and Contractor hereby expressly agree that the Court shall, subject to California Code of Civil Procedure §§ 1286.4 and 1296, vacate the Arbitration Award if, after review, the Court determines that the Arbitration Award does not fully conform to the foregoing. The confirmation, enforcement, vacation or correction of an arbitration award rendered hereunder shall be made by the Superior Court of the State of California for the county in which the Site is situated. The substantive and procedural rules for such post-award proceedings shall be as set forth in California Code of Civil Procedure § 1285 et seq.

5) Arbitration Fees and Expenses. The expenses and fees of the Arbitrator shall be divided equally among all of the parties to the arbitration. Each Party to any arbitration commenced hereunder shall be responsible for and shall bear its own attorneys' fees, witness fees and other costs or expenses incurred in connection with such arbitration. The foregoing notwithstanding, the Arbitrator may award arbitration costs, including Arbitrator's fees but excluding attorneys' fees, to the prevailing Party. By this arbitration provision, the District and the Contractor acknowledge and agree that neither shall recover from the other any attorney's fees associated with or arising out of any legal, administrative or other proceedings filed or instituted in connection with or arising out of the Contract Documents or the performance of either the District or the Contractor thereunder. The limited exceptions in the Contract Documents that provide attorney's fees for specific issues shall neither be construed as applying to this arbitration provision under California Civil Code § 1717(a) nor be deemed to be "authorized by the Laws."

6) Inapplicability to Bid Bond. The arbitration proceedings described above are not applicable to disputes, disagreements or enforcement of rights or obligations under the Bid Bond. All claims, disputes and actions to enforce rights or obligations under the Bid Bond shall be adjudicated only by judicial proceedings commenced in a court of competent jurisdiction.

**Article 79. FORCE MAJEURE.** Neither Party will be liable to the other for unanticipated delays or failures in performance resulting from causes beyond the reasonable control of that Party, including but not limited

to, acts of God, labor disputes or disturbances, material shortages or rationing, riots, acts of war, governmental regulations, communications or utility failures, casualties, pandemics, epidemics, or quarantines; provided that the delayed Party: (i) gives the other Party prompt written notice of such cause, (ii) uses its reasonable efforts to correct such failure or delay in its performance, and (iii) resumes performance as soon as reasonably practicable. Any and all delays resulting from a force majeure event, as specified herein, will only be classified as excusable, non-compensable delays.

**Article 80. COMPLIANCE WITH DTSC GUIDELINES – IMPORTED SOILS**

If the project requires the use of imported soils, the Contractor shall be responsible to use and shall certify that the imported material it uses is free of any hazardous and/or toxic substance or material of any nature or type as defined in accordance with California Law and the California Health and Safety Code. The District reserves the right to reject any imported material that has come from agricultural or commercial land uses. Contractor must notify the District of the source of material and comply with the applicable Regional Water Quality Control Board Resolutions and when applicable, with the guidelines of the Department of Toxic Substances Control (“DTSC”).

**Article 81. FINGERPRINTING**

District Determination of Fingerprinting Requirement Application

The District has considered the totality of the circumstances concerning the Project and has determined that the Contractor and Contractor’s employees (which includes Subcontractor employees):

  X   are subject to the requirements of Education Code § 45125.2 and Paragraph (a) below, is applicable.

       are not subject to the requirements of Education Code § 45125.2, and Paragraph (b) below, is applicable.

- a. Contracts for Construction, Reconstruction, Rehabilitation or Repair of a School Facility Involving More than Limited Contact with Students (§ 45125.2)

By execution of the Contract, the Contractor acknowledges that Contractor is entering into a contract for the construction, reconstruction, rehabilitation, or repair of a school facility where the Contractor and/or Contractor’s employees will have more than limited contact with students and the services to be provided do not constitute an emergency or exceptional situation. In accordance with Education Code § 45125.2 the Contractor shall, at Contractor’s own expense, (1) install a physical barrier to limit contact with students by Contractor and/or Contractor’s employees, and/or (2) provide for the continuous supervision and monitoring of the Contractor and/or Contractor’s employees by an employee of the Contractor who has received fingerprint clearance from the California Department of Justice, and/or (3) provide for the surveillance of the Contractor and Contractor’s employees by a District employee.

- b. Contracts for Construction, Reconstruction, Rehabilitation or Repair of a School Facility Involving Only Limited Contact With Students (§ 45125.2)

By execution of the Contract, the Contractor acknowledges that Contractor is entering into a contract for the construction, reconstruction, rehabilitation or repair of a school facility involving only limited contact with students. Accordingly, the Parties agree that the following conditions apply to any work performed by the Contractor and Contractor’s employees on a school site: (1) Contractor and Contractor’s employees shall check in with the school office each day immediately upon arriving at the school site; (2) Contractor and Contractor’s employees shall inform school office staff of their proposed activities and location at the school site; (3) Once at such location, Contractor and Contractor’s employees shall not change locations

without contacting the school office; (4) Contractor and Contractor's employees shall not use student restroom facilities; and (5) If Contractor and/or Contractor's employees find themselves alone with a student, Contractor and Contractor's employees shall immediately contact the school office and request that a member of the school staff be assigned to the work location.

**Article 82. LABOR COMPLIANCE MONITORING**

The Project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with Labor Code § 1771.1, all bidders, contractors and subcontractors working at the site shall be duly registered with the Department of Industrial Relations at time of bid opening and at all relevant times. Proof of registration shall be provided as to all such contractors prior to the commencement of any work. Contractor shall coordinate with the Architect to ensure the Department of Industrial Relations is advised of the award of the construction contract in a timely manner by filing form PWC-100 with the Department of Industrial Relations after award of the contract.

**Article 83. DRUGS, TOBACCO, ALCOHOL, ANIMALS**

The Contractor shall prohibit and take all steps necessary to ensure that its and its subcontractors' employees do not possess, consume, or work under the influence of any alcohol, tobacco or illegal drugs while on the Project site. The Contractor shall take all necessary steps to ensure that its and its subcontractor's employees comply with all applicable District policies and directives relating to appearance and behavior on school sites and/or District property. The Contractor shall prohibit and prevent its employees and subcontractor's employees from bringing any animal onto the Project.

**Article 84. NO DISCRIMINATION**

It is the policy of the District that, in connection with all work performed under this public works contract, there shall be no discrimination against any prospective or active employee or any other person engaged in the work because of actual or perceived race, color, ancestry, national origin, ethnic group identification, religion, sex, gender, sexual orientation, age, physical or mental disability, or marital status. The Contractor agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Government Code § 12900, Government Code § 11135, and Labor Code §§ 1735, 1777.5, 1777.6 and 3077.5. In addition, the Contractor agrees to require like compliance by all Subcontractors and suppliers.

**Article 85. GENERAL PROVISIONS**

a. Assignment and Successors:

Neither party may transfer or assign its rights or obligations under the Contract Documents, in part or in whole, without the other party's prior written consent. The Contract Documents are binding on the heirs, successors, and permitted assigns of the Parties hereto.

b. Third Party Beneficiaries:

There are no intended third party beneficiaries to the Contract.

c. Choice of Law and Venue:

The Contract Documents shall be governed by California law, and venue shall be in the Superior Court of the county in which the Project is located, and no other place.

d. Severability:

If any provision of the Contract Documents is determined to be illegal, invalid, or unenforceable, in part of

in whole, the remaining provisions, or portions of the Contract Documents shall remain in full force and effect.

e. Entire Agreement

The Contract Documents constitute the final, complete, and exclusive statement of the terms of the agreement between the Parties regarding the subject matter of the Contract Documents and supersedes all prior written or oral understandings or agreements of the Parties.

f. Waiver:

No waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents shall be effective unless it is in writing and signed by the Party waiving the breach, failure, right, or remedy. No waiver of any breach, failure, right, or remedy shall be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor shall any waiver constitute a continuing waiver unless the writing so specifies.

g. Headings

The headings in the Contract Documents are included for convenience only and shall neither affect the construction or interpretation of any provision in the Contract Documents nor affect any of the rights or obligations of the Parties to the Contract.

**Article 86. DISABLED VETERANS PARTICIPATION GOALS**

In accordance with Education Code § 17076.11, this District has a participation goal for disabled veteran business enterprises (“DVBE”) of at least 3 percent (3%) per year of the overall dollar amount of funds allocated to the District by the State Allocation Board pursuant to the Leroy F. Greene School Facilities Act of 1998 for construction or modernization and expended each year by the District. Prior to, and as a condition precedent for final payment under any contract for such project, the Contractor shall provide appropriate documentation to the District identifying the amount paid to DVBE in conjunction with the Contract, so that the District can assess its success at meeting this goal.

**Article 87. RETENTION OF DVBE RECORDS**

The Contractor agrees that, for all contracts subject to DVBE participation goals, the State and the District have the right to review, obtain and copy all records pertaining to performance of the contract in accordance with DVBE requirements. The Contractor agrees to provide the State or the District with any relevant information requested and shall permit the State or District access to its premises upon reasonable notice for purposes of interviewing employees and inspecting records. The Contractor agrees to maintain such records for a period of three years after final payment under the Contract.

[END OF GENERAL CONDITIONS DOCUMENT]



**COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 8  
SPECIAL CONDITIONS**

**00 73 00**  
**SPECIAL CONDITIONS**

- A. **Time of Performance.** The Contractor shall mobilize and commence work at the direction of District staff. The Contractor shall complete the Project within the period specified in the Special Conditions and in accordance with the schedule for the Project developed by the District for the Project, if applicable. In entering into this Agreement, Contractor acknowledges and agrees that the construction duration stipulated herein is adequate and reasonable for the size and scope of the Project.

Work under this Contract shall be scheduled and coordinated in compliance with the following:

1. The anticipated date of the award of the Contract is **Tuesday February 20<sup>th</sup>, 2024**
2. Bid submittals are due on **February 1, 2024 at 2:00 p.m.**
3. **Substitutions to Specified Materials, Processes, or Articles Prior to Bid Submittal:** Any proposals for substitutions of equipment, materials, or products other than what is specified in the bid documents must be submitted, in writing, to the District. After reviewing the request, the District will respond with its decision to all parties who have received a bid package. The District has the right to reject any or all requests for substitutions of equipment, materials, or products other than what is specified in the bid documents. The Bidder shall bear all of the District's costs associated with the review of substitution requests.
4. Work shall begin immediately following award of the Contract, or as directed by the District's **[Insert appropriate District Staff e.g. Executive Director of Facilities, Maintenance and Operations]**.
5. Contractor shall complete work under this agreement as identified in the Scope of Work and Drawings and Specifications, or as arranged by the District's Josh Savage; **Executive Director of Facilities, Maintenance and Operations]**.
6. The Contractor acknowledges that it fully understands the Project work to be performed has been scheduled by the District for a specific time period. In addition the Contractor acknowledges that it fully understands that scheduling has been established for this Project in order to promote the best usage of school facilities and to timely provide an appropriate learning environment for students to the fullest extent possible. With these understandings in mind, pursuant to the General Conditions regarding the District's Right to Terminate Contract, it is acknowledged and understood by the Contractor that it is a substantial violation of the Contract for the Contractor to fail to provide all submittals in the time specified and identified. Furthermore, it is acknowledged and understood by the Contractor that it is a substantial violation of the Contract for the Contractor to fail to provide a full work crew or properly skilled workers with proper and sufficient materials and equipment from the first day of Project work scheduled.

If the site will not be available after the scheduled start date, Contractor shall utilize this time period for administrative tasks and initial mobilization and shall coordinate such activities with District.

- B. **Future Work:** All future work awarded from this bid shall be coordinated with the District's Josh Savage; **Executive Director of Facilities, Maintenance and Operations]** or his/her designee and the Contractor. No work shall be started until scheduling has been agreed upon by all Parties.
- C. **Liquidated Damages – Contract Submittals:** If the executed Contract and required bonds and certificates of insurance are not received by the District within five (5) day of Contract award, the agreed liquidated damages established in the General Conditions is **five hundred dollars (\$500.00) per day** for each calendar date the start date is delayed.

**Liquidated Damages – Time of Completion:** If work under this Contract is not at Substantial Completion within the specified time period, the agreed liquidated damages established in the General Conditions is **Twelve Hundred Fifty Dollars (\$1,250) per day** for each calendar date Substantial Completion is delayed.

- D. **Documents Furnished.** The number of copies of Drawings and Specifications to be furnished to Contractor free of charge, per Article 3 of the General Conditions, is one (1). The cost for additional copies of the drawings shall be borne by the Contractor.
- E. **Bonds.** Contractor shall provide (i) a bid bond or cashier’s check payable to Cotati-Rohnert Park Unified School District in the amount not less than the total amount of the bid; (ii) a payment bond in the amount of one hundred percent (100%) of the total amount of the Contract Price or as specified in the Information for Bidders; and (iii) a performance bond in the amount of one hundred percent (100%) of the Contract Price or as specified in the Information for Bidders.
- F. **Insurance.** As provided in General Conditions, Contractor shall procure and maintain and shall require all subcontractors, if any, whether primary or secondary, to procure and maintain either:

**Comprehensive General Liability Insurance.**  
with a combined single limit per occurrence of not less than \$1,000,000

**OR**

**Commercial General Liability and Property Damage Insurance**  
(including automobile insurance) which provides limits of not less than:

- (a) Per occurrence (combined single limit) \$1,000,000
- (b) Project Specific Aggregate (for this project only) \$2,000,000
- (c) Products/Completed Operations \$1,000,000
- (d) Personal & Advertising Injury limit \$1,000,000

**AND**

**Builder's Risk (or Course of Construction Coverage) Applicable/Fire Insurance**  
Project Replacement Value at 100% (One Hundred Percent) (see Article 31 of the General Conditions).

**Insurance Covering Special Hazards:** The following special hazards shall be covered in addition to the above-mentioned commercial liability insurance or property damage insurance policy or policies of insurance, or by special policies of insurance, in amounts as follows:

- Automotive and truck where operated in the amount of \$1,000,000
- Material hoist where used in the amount of \$1,000,000
- Explosion, collapse & Underground (XCU) coverage \$1,000,000
- Excess Liability Insurance coverage in the amount of \$1,000,000

**Additional Insurance:** As provided in General Conditions, Contractor shall procure and maintain and shall require all subcontractors, if any, whether primary or secondary, to procure and maintain Worker’s Compensation Insurance (Article 31 of the General Conditions) and Automobile Liability Insurance (Article 31 of the General Conditions).

- G. **Executed Copies:** The number of executed copies of the Agreement, the Performance Bond, and the Payment Bond for Public Works required is **two (2)**.
- H. **License Classification:** Each bidder shall be a licensed Contractor pursuant to the Business and Professions Code and shall be licensed in the following classification(s), including but not restricted to: **B**
- I. **Certification Requirements:** When specified in the bid documents, the Contractor or subcontractor must be certified by the factory or manufacturer to install equipment or other products. Such certifications must be obtained prior to submittal of the bid.
- J. **Fingerprinting:**

Pursuant to the provisions of Article 81 of the General Conditions, the District Determination of Fingerprinting Requirement Application is as follows:

- a. The District has considered the totality of the circumstances concerning the Project and has determined that the Contractor and Contractor's employees:
1. **X** are subject to the requirements of Education Code section 45125.2 and Paragraph (a) of Article 81 of the General Conditions. Fingerprinting and criminal background checks are required for this project.
  2. \_\_\_\_\_ are not subject to the requirements of Education Code section 45125.2 and are subject to Paragraph (b) of Article 81 of the General Conditions.

- K. **Cleaning Up:** Pursuant to the specific provisions of Article 63 "Cleaning Up" of the General Conditions, the Contractor is responsible at all times to keep the premises free from debris, waste, rubbish and excess materials and dispose of it in disposal site in accordance with provisions of existing law. The Contractor acknowledges and understands that the Project work hereunder is to be performed on existing and functioning school facilities. The Contractor hereby acknowledges and agrees that if and/or when the Contractor fails to fulfill its clean-up responsibility on a daily basis, the District will undertake to authorize additional regular work or overtime work by its own maintenance and/or custodial employees to keep the premises free from debris, waste and rubbish by authorizing regular and/or overtime work for its maintenance and/or custodial employees. This work time shall be charged back to the Contractor and deducted from the Contractor's progress payments and/or final payment at the rate of **\$23.77 per hour for regular time and \$47.42 per hour for overtime**. The Contractor will not be notified in advance of any such cleanup of the premises to be performed by the District's employees unless the number of hours required in any work week for such cleanup of the premises by District employees is both anticipated and estimated by the District to exceed five (5) total weekly hours of either the regular or overtime rates specified herein or the combined regular and overtime rates specified herein.

- L. **Inspector's Field Office:** **Not applicable to this project.**

- M. **Time of Work Restrictions.** The worksites will be available Monday through **Friday, from 7 AM to 7 PM**. This schedule is subject to change as the needs of the District require, and would be scheduled with the District's **Josh Savage, Executive Director of Facilities, Maintenance and Operations** or his/her designee.

- N. **Project Phases.** None

- O. **Safety Barriers and Fencing.** Work on this project will occur on an occupied school site. Students and staff will be present in close proximity to construction activities. Contractor will provide 6 foot high plywood sheathed barrier

adjacent to walkways. Contractor to assume providing no less than 400 linear feet of plywood barriers for the project. All other areas to be protected from student access by chain link fence barriers with fabric wind screens.

### **SCOPE OF WORK**

The Cotati-Rohnert Park Unified School District is seeking bids for University Elementary at La Fiesta Re-Roof and HVAC Replacement at 8511 Liman Way, Rohnert Park, CA 94928 See attached specifications for scope. Please refer to the Drawings and Specifications for further details.

### **PROJECT SCHEDULE**

Anticipated Start Date: **June 9<sup>th</sup>, 2024**

Completion Date: **Entire scope of work to be completed by August 2, 2024**

[END OF SPECIAL CONDITIONS]

**COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID No. 23-020**

**SECTION 9  
SPECIFICATIONS**

## **SPECIFICATIONS**

The Drawings and Specifications shall be attached or incorporated by reference below.

# **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**

## **University Elementary at La Fiesta Re-Roof and HVAC**

**BID NO. 23-020**

**SECTION 10  
PROJECT FORMS &  
CERTIFICATIONS**



[DISTRICT LETTERHEAD]

**00 51 00**  
**NOTICE OF INTENT TO AWARD**

[insert addresses for all bidders]

Re: Notice of Intent to Award

The Cotati-Rohnert Park Unified School District ("District") hereby notifies you of its intent to award the recently bid **[Insert Project Name] Project** to [redacted] at its bid price of \$[redacted].

**[[Insert name of apparent low bidder]]** is requested to execute the Contract and furnish the required Performance Bond and Payment Bond using the bond forms provided in the Contract Documents and the required certificates of insurance within ten (10) calendar days from the date of issuance of this Notice.

If you fail to execute the Contract and to furnish the bonds and insurance within ten (10) calendar days from the date of issuance of this Notice, the District may consider all your rights arising out of its acceptance of your bid as abandoned and your Bid Bond forfeited. The District will be entitled to such other rights as may be granted by law.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 202\_.

Very truly yours,

By \_\_\_\_\_  
Authorized District Signature

**[DISTRICT LETTERHEAD]**

**00 55 00**  
**NOTICE TO PROCEED**

To:

Date:

SUBJECT: **NOTICE TO PROCEED**

PROJECT: **[Insert Project Name]**

Dear \_\_\_\_\_:

You are hereby notified to commence work on the above referenced project for the not-to-exceed amount of **[Insert Contact Amount]** for the base bid proposal.

Work shall commence on **[Insert start date]** and shall be fully complete within the Contract Time set forth in the Contract Documents with a final completion date of **[Insert Final Completion Date]**. Delivery of submittals shall commence upon receipt of the District's Notice to Proceed.

The Contract Documents provide for an assessment of \$1,250 as liquidated damages for each consecutive calendar day that the work remains incomplete after the above established contract completion date.

By: \_\_\_\_\_  
Authorized District Signature

00 45 26  
WORKERS' COMPENSATION CERTIFICATION

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:

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

(b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, 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 his employees.

(c) 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 section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company

(In accordance with article 5 (commencing at section 1860), chapter 1, part 7, division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under this contract.)

**DRUG-FREE WORKPLACE CERTIFICATION**

This Drug-Free Workplace Certification form is part of the Contract made by and between the **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT** (hereinafter referred to as the "District" and \_\_\_\_\_ (hereinafter referred to as the ("Contractor") for the **[Insert Project Name]**, Bid No. \_\_\_\_\_ Project (hereinafter referred to as the "Project." This form is required from all successful bidders pursuant to the Drug-Free Workplace Act of 1990 (Government Code section 8350 et seq.) The Drug-Free Workplace Act requires that every person or organization awarded a contract or grant for procurement of any property or service from any State agency must certify that it will provide a drug-free workplace by doing 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, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred. The District is not a "state agency" as defined in the applicable section(s) of the Government Code, but the District is a local agency under California law and requires all contractors on public works projects to comply with the provisions and requirements of the Drug-Free Workplace Act.

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:

- A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in their workplace and specifying actions which will be taken against employees for violations of the prohibition;
- B. Establishing a drug-free awareness program to inform employees about all of the following:
  - 1. The dangers of drug abuse in the workplace;
  - 2. The person's or organization's policy of maintaining a drug-free workplace;
  - 3. The availability of drug counseling, rehabilitation and employee-assistance programs; and
  - 4. The penalties that may be imposed upon employees for drug abuse violations.
- C. 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 the Drug-Free Workplace Act as it now exists or may hereinafter be amended. Particularly, I shall abide by Government Code section 8355 when performing the Contract for the Project by:

- A. Publishing a statement notifying employees concerning the prohibition of controlled substance at my workplace;
- B. Establishing a drug-free awareness program; and
- C. Requiring that each employee engaged in the performance of the contract be given a copy of the statement required by section 8355(a) and agree to abide by the terms of that statement.

I also understand that if the 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, the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that if I violate the terms of the Drug-Free Workplace Act, I may be subject to debarment.

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.

Executed on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ at \_\_\_\_\_.

\_\_\_\_\_  
Name of Contractor (Print or Type)

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

**00 45 27.01**  
**CONTRACTOR'S CERTIFICATE REGARDING**  
**ALCOHOLIC BEVERAGE AND TOBACCO-FREE CAMPUS POLICY**

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

DATE: \_\_\_\_\_ Contractor \_\_\_\_\_

By: \_\_\_\_\_  
Signature

**ASBESTOS-FREE MATERIALS CERTIFICATION**

The undersigned declares that he or she is the person who executed the bid for University Elementary at La Fiesta Re-Roof and HVAC, Bid No. 23-020 ("Project"), and submitted it to the Cotati-Rohnert Park Unified School District on behalf of \_\_\_\_\_ ("Contractor").

To the best of my knowledge, information and belief, in completing the Contractor's Work for the Project, no material furnished, installed or incorporated into the Project will contain, or in itself be composed of, any materials listed by the federal or state EPA or federal or state health agencies as a hazardous material.

Any disputes involving the question of whether or not material installed with asbestos-containing equipment is settled by electron microscopy; the cost of any such tests shall be paid by the Contractor.

All work or materials installed by the Contractor which is found to contain asbestos, or work or material installed with asbestos-containing equipment, will be immediately rejected and this work shall be removed and replaced by the Contractor 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.

The asbestos consultant shall be chosen and approved by the Construction Manager/Architect or the District who shall have sole discretion and final determination in this matter.

The work will be not accepted until asbestos contamination is reduced to levels deemed acceptable by the Asbestos Consultant.

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

Executed on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

---

Name of Contractor (Print or Type)

---

Signature

---

Print Name

---

Title

**00 45 27.03**

**CONTRACTOR & SUBCONTRACTOR FINGERPRINTING REQUIREMENTS**

**CONTRACTOR CERTIFICATION**

With respect to the Contract dated \_\_\_\_\_ 20\_\_ by and between Cotati-Rohnert Park Unified School District (“District”) and \_\_\_\_\_ (“Contractor”), Contractor hereby certifies to the District’s governing board that it has completed the criminal background check requirements of Education Code Section 45125.1 and that none of its employees that may come in contact with District’s pupils have been convicted of a violent felony listed in Penal Code section 667.5(c) or a serious felony listed in Penal Code section 1192.7(c).

\_\_\_\_\_  
Contractor’s Representative      Date

*or*

**CONTRACTOR EXEMPTION**

Pursuant to Education Code Sections 45125.1 and 45125.2, the Cotati-Rohnert Park Unified School District (“District”) has determined that \_\_\_\_\_ (“Contractor”) is exempt from the criminal background check certification requirements for the Contract dated \_\_\_\_\_ 20\_\_ by and between the District and Contractor (“Contract”) because:

- The Contractor’s employees will have limited contact with District students during the course of the Contract;
- Emergency or exceptional circumstances exist; or
- With respect to contractors constructing, reconstructing, rehabilitating or repairing a school facility, as provided in Section 45125.2, the Contractor has agreed to ensure the safety of pupils at the school facility by the following method(s) specified in Section 45125.2:

\_\_\_\_\_.

\_\_\_\_\_  
School District Official      Date



**CONTRACTOR & SUBCONTRACTOR FINGERPRINTING REQUIREMENTS**

**SUBCONTRACTOR’S CERTIFICATION**

The Cotati-Rohnert Park Unified School District (“District”) entered into a Contract for services with \_\_\_\_\_ (“Contractor”) on or about \_\_\_\_\_, 20\_\_\_\_ (“Contract”). This certification is submitted by \_\_\_\_\_, a subcontractor to the Contractor for purposes of that Contract (“Subcontractor”). Subcontractor hereby certifies to the District’s governing board that it has completed the criminal background check requirements of Education Code Section 45125.1 and that none of its employees that may come in contact with District pupils have been convicted of a violent felony listed in Penal Code Section 667.5(c) or a serious felony listed in Penal Code Section 1192.7(c).

\_\_\_\_\_  
Subcontractor’s Representative      Date

*or*

**SUBCONTRACTOR’S EXEMPTION**

The Cotati-Rohnert Park Unified School District (“District”) entered into a Contract for services with \_\_\_\_\_ (“Contractor”) on or about \_\_\_\_\_, 20\_\_\_\_ (“Contract”). Pursuant to Education Code Sections 45125.1 and 45125.2, the District has determined that \_\_\_\_\_, a subcontractor to the Contractor for purposes of that Contract (“Subcontractor”), is exempt from the criminal background check certification requirements for the Contract because:

- The Subcontractor’s employees will have limited contact with District students during the course of the Contract;
- Emergency or exceptional circumstances exist; or
- With respect to contractors constructing, reconstructing, rehabilitating or repairing a school facility, as provided in Section 45125.2, the Contractor and/or Subcontractor have agreed to ensure the safety of pupils at the school facility by the following method(s) specified in Section 45125.2:  
\_\_\_\_\_.

\_\_\_\_\_  
School District Official      Date

**00 45 27.04**

**BIDDER'S ACKNOWLEDGEMENT OF PROJECT SCHEDULE**

**University Elementary at La Fiesta Re-Roof and HVAC**

**BID No. 23-020**

The undersigned acknowledges that he/she has carefully and thoroughly reviewed the Project Schedule, included herein and made a part of the Contract Documents.

The undersigned fully understands the manpower requirements necessary to complete the project in accordance with the Project Schedule and agrees to furnish all labor, materials and equipment necessary, upon District acceptance of bidder's proposal, to fully comply with this schedule. The undersigned agrees to comply with any and all adjustments to the schedule, as may be directed by the District or its representative, and which may be required to ensure project completion as stipulated in the Contract Documents.

The undersigned acknowledges that failure to comply with the above could result in delays to other contractors, whose bona fide and substantiated cost impacts due to said delays may be borne by the undersigned.

ACKNOWLEDGED AND AGREED:

DATE: \_\_\_\_\_

\_\_\_\_\_  
CONTRACTOR

BY: \_\_\_\_\_  
Signature

00 45 27.05

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND  
VOLUNTARY EXCLUSION**

I am aware of and hereby certify that neither \_\_\_\_\_ nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. I further agree that I will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the bidder/offeror/ contractor or any lower participant is unable to certify this statement, it shall attach an explanation to this solicitation proposal.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal of the above named bidder on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ for the purposes of submission of this bid.

(Corporate Seal)

By \_\_\_\_\_

Signature

\_\_\_\_\_  
Typed or Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

As the awardee under this Bid, I hereby certify that the above certification remains valid as of the date of contract award, specifically, as of the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for the purposes of award of this contract.

(Corporate Seal)

By \_\_\_\_\_

Signature

\_\_\_\_\_  
Typed or Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**00 45 27.06**

**IRAN CONTRACTING ACT CERTIFICATION**

As required by California Public Contract Code Section 2204, the Bidder certifies subject to penalty for perjury that the option checked below relating to the Bidder's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 et seq.) is true and correct:

- The Bidder is not:
  - (i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or
  - (ii) a financial institution that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.
  
- The District has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, Agency will be unable to obtain the goods and/or services to be provided pursuant to the Contract.
  
- The amount of the Contract payable to the Contractor for the Project does not exceed \$1,000,000.

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

\_\_\_\_\_  
Signature Date

\_\_\_\_\_  
Name Title

\_\_\_\_\_  
Name of Firm

**00 45 27.07**  
**ESCROW AGREEMENT FOR SECURITY DEPOSITS**  
**IN LIEU OF RETENTION**

This Escrow Agreement is made and entered into by and between the **COTATI-ROHNERT PARK UNIFIED SCHOOL DISTRICT**, hereinafter called "OWNER", and \_\_\_\_\_, hereinafter called "CONTRACTOR", and \_\_\_\_\_, 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 in the amount \_\_\_\_\_ (\$ \_\_\_\_\_) pursuant to the Construction Contract entered into between the OWNER and CONTRACTOR for \_\_\_\_\_ **Project** 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 \_\_\_\_\_ as the 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 default, 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 Agent:

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Address

On behalf of Contractor:

\_\_\_\_\_  
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

**00 45 28.04**  
**CONTRACTOR'S CERTIFICATE REGARDING**  
**PARTICIPATION OF**  
**DISABLED VETERAN BUSINESS ENTERPRISES**

In accordance with Education Code Section 17076.11, the District has a participation goal for Disabled Veteran Business Enterprises of at least three percent (3%) per year of the overall dollar amount of funds allocated by the District by the State Allocation Board pursuant to the Leroy F. Greene School Facilities Act of 1998 for construction or modernization of school buildings and expended each year by the District. At the time of execution of the contract, the Contractor will provide a statement to the District of anticipated participation of Disabled Veteran Business Enterprises in the contract. Prior to, and as a condition precedent for final payment under the contract, the Contractor will provide appropriate documentation to the District identifying the amount paid to Disabled Veteran Business Enterprises pursuant to the contract, so that the District can assess its success at meeting this goal.

I certify that I have read the above and will comply with the anticipated participation of Disabled Veteran Business Enterprises in this contract.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Typed or Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company

\_\_\_\_\_  
Email

230-5/6582728.1

## SECTION 01 1100

### SUMMARY OF WORK

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Work covered by Contract Documents.
- B. Work under separate contracts.
- C. Execution, correlation and intent.
- D. Acceptance of site.
- E. Related documents.
- F. Contractor's use of premises.
- G. Access.
- H. Existing conditions.

##### 1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project name is:

**Alterations to Building A University ES @ La Fiesta HVAC Replacement**

as shown on the Contract Documents prepared by Quattrocchi-Kwok Architects and briefly described as:

**Alterations to Building A University ES @ La Fiesta HVAC Replacement:** Modernization of mechanical system to classroom building A; includes, replace HVAC system, cover open mechanical well to match existing building roof line and new fire alarm system.

- B. The Work shall be constructed under single fixed-price Contract.
- C. The Work of the Contract includes but is not necessarily limited to:
  - 1. Selective demolition, hazardous material abatement and construction necessary for the modernization of existing school building, including associated civil, architectural, structural, plumbing, mechanical and/or electrical work as indicated in the Drawings and Specifications. Generally these categories of work involve new finishes, adaptive re-use and modification of certain selected areas, accessibility modernization, and adding HVAC to instructional areas, library and administrative area and pertain to changing and expanding selected infrastructure utilities and extensive modifications. The Project will involve construction phasing and barricading of work areas as required to separate construction areas from occupied spaces and as needed to accommodate the Owner's schedule and use of the site.



2. All other work as shown in the Contract Documents.
3. The Work shall include all labor, materials and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents, including but not limited to:
  - a. Home office overhead,
  - b. Off-Site supervision,
  - c. Project Administration including preparation, research and distribution of project correspondence and submittals,
  - d. Schedule preparation and maintenance,
  - e. Guarantys and warrantys,
  - f. On-Site supervision,
  - g. Temporary protection,
  - h. Temporary utilities and facilities, including mobilization and demobilization,
  - i. Material handling and storage,
  - j. Safety equipment,
  - k. Travel time to and from the Site to the Contractor's home office.
- D. Sequence the Work subject to the Owner's use of the site, the requirements of the Construction Phasing, Technical Specifications and the Contract provisions for Liquidated Damages found elsewhere in these documents.
- E. Perform work indicated or required to produce finished results shown.
- F. Contractor shall coordinate all work and shall be responsible for division of work among the various subcontractors.
  1. Coordinate the work of this Contract with the activities of the Owner, and with PG&E and other serving utilities.
  2. Coordinate the work of this Contract with the activities of the Owner's separate contractors, including those for removal or abatement of Hazardous Materials.
- G. Laws and Regulations: Intent of the Contract Documents is to construct the Work shown therein, in accordance with applicable codes and regulations.

### **1.03 WORK UNDER SEPARATE CONTRACTS**

- A. Serving Utilities may be performing certain utility work concurrent with this Contract.

### **1.04 EXECUTION, CORRELATION AND INTENT**

- A. Correlation and Intent
  1. Documents Complementary and Inclusive:
    - a. The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work.
    - b. 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.
  2. Coverage of the Drawings and Specifications:
    - a. 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.

- b. 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.
  - c. All materials or labor for Work, which is shown on either by the Drawings or the Specifications (or is reasonably inferable therefrom as being necessary to complete the Work), shall be provided by the Contractor whether or not the Work is expressly covered in either the Drawings and/or the Specifications.
  - d. 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.
3. Conflicts. In the event there is a discrepancy between the various Contract Documents, the Owner/Contractor Agreement shall control. Without limiting Contractor's obligation to identify conflicts for resolution by the Architect identified elsewhere in this Article it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.
4. Conformance With Laws:
- a. 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, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon application of either party the Contract shall be amended in writing to make such insertion or correction.
  - b. Before commencing any portion of the Work, Contractor shall check and review the Contract Documents for such portion for conformance and compliance with all laws, ordinances, codes, rules and regulations of all governmental authorities and public 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.
  - c. In the event Contractor observes any violation of any law, ordinance, code, rule or regulation, or inconsistency with any such restrictions or special requirements of the Contract Documents, Contractor shall immediately notify Architect in writing of same and shall cause to be corrected any such violation or inconsistency in the manner provided hereunder.
5. Ambiguity:
- a. 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.
  - b. Contractor shall immediately notify Owner and Architect of any perceived or alleged error, inconsistency, ambiguity, or lack of detail or explanation in the Drawings and Specifications in the manner provided herein.
  - c. 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.

- d. If Contractor performs, permits, or causes the performance of any Work under the Contract Documents prepared by or on behalf of Contractor which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction, without increase to or adjustment in the Contract Price or the time for performance.
  - e. In no case shall any Subcontractor proceed with the Work if uncertain without the Contractor's written direction and/or approval.
- B. Addenda and Deferred Approvals
1. Addenda. Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda only to the extent specified. In accordance with Title 24, California Code of Regulations, addenda shall be approved by the DSA.
  2. Deferred Approvals. The requirements approved by the DSA on any item submitted as a deferred approval in accordance with Title 24, California Code of Regulations, shall take precedence over any previously issued addenda, drawing or specification.
- C. Specification Interpretation and Application:
1. Titles. The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved.
  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.
  3. Provide. "Provide" means "provided complete in place," that is, furnished, installed, tested, and ready for operation and use.
  4. General Conditions. The General Conditions and supplementary general conditions are a part of each and every section of the Specifications.
  5. Abbreviations.
    - a. In the interest of brevity, the Specifications are generally written in an abbreviated form in the imperative tense and may not include complete sentences.
    - b. Omission of words or phrases such as "Contractor shall," "shall be," etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory and directed to the Contractor.
    - c. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.
  6. Plural. Words in the singular shall include the plural whenever applicable or the context so indicates.
  7. 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."
  8. 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.
    - a. 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.

- b. 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.
  - c. Procurement of reference standards and standard specifications is the sole responsibility of the Contractor.
9. Absence of Modifiers. 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 shall not affect the interpretation of either statement.

**D. Rules of Document Interpretation**

1. In the event of conflict or ambiguity within the drawings, the following rules shall apply:
  - 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. General or Typical Details and Symbols apply at all locations where specifically noted; at all locations conforming to the title of the Detail; at all locations of similar or identical graphic indication; at all locations where similar conditions are not fully or specifically shown or identified and complement similar details of specific conditions.
  - e. Details and Notes apply at all locations of similar or identical graphic indications and at all locations where similar conditions are not fully or specifically shown or identified.
  - f. Limitation of Indication does not affect Extent of Application: Indications of notes, details, and symbols may be limited to promote clarity. No limitation of application is intended nor shall be construed unless specifically noted.
  - g. Figured, derived, or numerical dimensions shall govern. At no time shall the Contractor base construction on scaled drawings.
2. Specifications shall govern as to materials, workmanship, and installation procedures.
3. In the case of disagreement or conflict between or within standards, specifications, and drawings, the more stringent, higher quality, and greater quantity of Work shall apply.

**1.05 ACCEPTANCE OF SITE**

- A. Contractor shall accept the site in the condition in which it exists at the time it is given Notice to Proceed.

**1.06 RELATED DOCUMENTS**

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specifications apply to the Work of this Section.

**1.07 CONTRACTOR'S USE OF PREMISES**

- A. Confine operations on the site to areas indicated in the Contract Documents. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the Work while engaged in project construction.
- B. Contractor shall limit its use of the premises for work and storage to allow for work by other contractors.

- C. Maintain existing driveways and entrances serving the premises clear and available to the Owner and its employees at all times. Do not use these areas for parking or storage of materials.
- D. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to area approved by the Architect. If additional storage is necessary, Contractor shall obtain and pay for such storage off site without additional expense to the Owner.
- E. Do not overload structures with weight that will endanger them.
- F. Assume full responsibility for protection and safekeeping of materials and tools stored at the site. 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.
- G. Move any stored products, temporary facilities, controls or fencing, under Contractor's control, which interfere with operations of the Owner or separate contractors, on or off the site, without cost to the Owner.
- H. Contractor shall cooperate with Owner and governing authorities to minimize disturbance. Observe all local ordinances for timing of work.
- I. In entrance and exit of all workmen and in bringing in, storing and removal of equipment, Contractor shall avoid unnecessary dust, mud or accumulated debris, or undue interference with the convenience, sanitation or routine of Owner's activities.
- J. In connecting new utilities to existing, and similar operations, Contractor shall time and coordinate such operations so that there will be no interference with Owner's activities.
- K. Protect improvements on adjoining properties as well as those on the Owner's property.
- L. Restore any improvements damaged by this work to their original condition as acceptable to the Owner.
- M. Do not interfere with use of adjacent buildings. Maintain free and safe passage to and from.
- N. Contractor shall be responsible for safety and support of structure. Cease operations and notify Architect immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored. Contractor shall assume liability for such movement, settlement, damage or injury.
- O. Provide, erect and maintain barricades and guard rails as required by governing regulatory agencies to protect occupants of building and workers.
- P. Where demolition, removal or rework occurs, take all necessary precautions to protect existing finished work remaining in place from damage. Finished work damaged by operations under this contract shall be repaired or replaced to the satisfaction of Owner and Architect at no extra cost to the Owner.

#### 1.08 1.08 OWNER'S USE OF THE SITE

- A. Owner will remain in continuous occupancy of the site. Summer School, community use of athletic fields, after-hours Daycare and other site programs will be concurrent with this Contract. Owner reserves the right to limit hours of construction access and deliveries to avoid traffic conflicts during peak periods.
- B. Certain on and off-site work will be performed by others. A portion of this work, including the completion of preceding contracts, may be constructed concurrently with this Contract. The District will have various additional contracts for summer work and other projects from time-to-time on the site concurrent with this Contract.

#### 1.09 ACCESS

- A. During the life of the Contract, maintain access to the site, and within the site to the building, for fire-fighting equipment, ambulance and police vehicles in accord with local fire marshal regulations.
  - 1. The Work of this Contract shall be performed, and such temporary facilities and phasing of activities provided, so as not to interfere with access to adjacent facilities or new work areas, so as to cause the least possible interference with activities of other contractors, the Owner's personnel or the public, and so as to protect persons and property from harm. Required accessways, and other accessways not required but so designated by the Owner or the Contract Documents, shall not be blocked.
  - 2. No utility service, such as water, gas, sewers, electricity, communication or fire protection system serving the project, or any part of it, shall be interrupted without prior written approval of the Owner.
- B. The DISTRICT has considered the totality of the circumstances concerning the Project and the CONTRACTOR and CONTRACTOR's employees (which includes Subcontractor employees) subjection to the FINGERPRINTING REQUIREMENTS of Education Code Section 45125.2. **Contractor shall comply with the determination regarding fingerprint certification as defined in the general conditions.**
- C. Contractor acknowledges that access to the project following occupancy by the Owner shall be subject to the requirements of Education Code Section 45125.2 as set forth in the General Conditions of the Contract and further acknowledges that all sums necessary to implement such compliance are included in the Bid Proposal.
- D. Contractor is notified that the Site is congested, with limited access. It shall be the Contractor's responsibility to coordinate Contractor's Work with the Work of other Prime Contractors performing work on the site. Areas designated by the Owner shall remain off-limits to construction personnel and equipment during construction.

- E. Contractor is hereby notified that the project site borders a residential neighborhood. Contractor acknowledges that the Work shall be performed during regular business hours. Contractor shall make provisions for the safety of residents and the general public adjacent to the site while working in proximity to the these areas or while working off-site.

#### **1.10 EXISTING CONDITIONS**

- A. Intent of the Drawings is to show existing conditions with information developed from field surveys and Owner's records, and to generally show the extent and type of work required to prepare the existing areas for new work. The information shown on the Drawings is not a guarantee of existing conditions.

#### **1.11 LIQUIDATED DAMAGES AND CONTRACT COMPLETION**

- A. Liquidated Damages will be assessed beginning on the Date contractually required for Completion and shall continue to accrue until each of the listed conditions are fulfilled.
- B. Date of Completion and Beneficial Occupancy is defined as the Date of Completion of all punch list items, including, but not limited to the following:
  1. Confirmation of mechanical and electrical systems testing and balancing, control sequences and operations.
  2. Completion of final cleaning, paint touch-up and adjusting.
  3. Adjustment and Contractor's certification of the finish hardware operation.
  4. Removal of Contractor's temporary facilities and materials.
  3. Owner's acceptance of the Work.
- C. Owner's occupancy prior to completion of any or all of the above items, or other such missing or incomplete work as may occur, shall not be construed as acceptance of the Work or as Completion when defined for the purposes of assessing Liquidated Damages.

#### **PART 2 - PRODUCTS**

Not Used.

#### **PART 3 - EXECUTION**

Not Used.

**END OF SECTION**

**SECTION 01 2600**

**MODIFICATION PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submittals.
- B. Documentation of change in Contract Sum and Contract Time.
- C. Change procedures.
- D. Execution of change orders.
- E. Correlation of Contractor submittals.

**1.02 RELATED SECTIONS**

- A. Document - Agreement: Monetary values of established Unit Prices.
- B. Document - General Conditions and Supplementary General Conditions: Governing requirements for changes in the Work, in Contract Sum and Contract Time and percentage allowances for Contractor's overhead and profit.
- C. Section 01 2900 - Applications for Payment: Payment applications and Schedule of Values.
- D. Section 01 3200 - Construction Progress Schedules: Work schedule.
- E. Section 01 6000 - Product Requirements: Product options and substitutions.
- F. Section 01 7000 - Contract Closeout: Project record documents.

**1.03 SUBMITTALS**

- A. Submit name of the individual in Contractor's firm authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. The following submittals shall be made on forms prepared by the Architect:
  - 1. Request For Information Forms.
  - 2. Architect's Supplemental Instructions Forms.
  - 3. Request For Proposal Forms.
  - 4. Change Order Forms.

**1.04 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME**



- A. Maintain detailed records of work done. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
- C. Provide additional data to support computations:
  - 1. Quantities of products, labor, and equipment.
  - 2. Taxes, insurance, and bonds.
  - 3. Overhead and profit.
  - 4. Justification for any change in Contract Time.
  - 5. Credit for deletions from Contract, similarly documented.

#### **1.05 REQUEST FOR INFORMATION ("RFI")**

- A. An RFI is a written request prepared by the Contractor asking the Architect to provide additional information necessary to clarify an item which the Contractor feels is not clearly shown or called for in the drawings or specifications, or to address questions which have arisen under field conditions.
  - 1. RFI's shall be submitted by the Contractor to the Architect on the form which is included in the project. Submittals not conforming to this requirement will be returned.
- B. 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/or interpretations of the issue raised by the RFI. An RFI cannot modify the Contract Cost, Contract Time, or the Contract Documents.
- C. The Architect must respond to a RFI within fourteen (14) calendar days after receiving such request. If the Architect cannot respond to the RFI within fourteen (14) calendar days, the Architect shall notify the Contractor, with a copy to the Inspector and the Owner, of the amount of time that will be required to respond.
- D. The Contractor shall be invoiced by the Owner for any costs incurred for professional services, which shall be deducted from the next progress payment, if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request.

#### **1.06 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS ("ASI")**

- A. An ASI is a written supplemental instruction issued and signed by the Architect for minor changes to the Work, without change in Contract Sum or Contract Time.
- B. Architect Authority;
  - 1. The Architect will have authority to order minor changes in the Work not involving any adjustment in the Contract Sum, an extension of the Contract Time, or a change which is inconsistent with the intent of the Contract Documents.
  - 2. Such changes shall be effected by written Change Order and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

**1.07 REQUEST FOR PROPOSAL ("RFP")**

- A. An RFP is a written request prepared by the Architect asking the Contractor to submit to the Owner and the Architect an estimate of the effect of a proposed change on the Contract Price and the Contract Time.
- B. An RFP shall contain adequate information, including any necessary drawings and specifications, to enable Contractor to provide the cost breakdowns.
- C. Owner or Architect may initiate changes by submitting a proposal request to Contractor. Request will include:
  - 1. Detailed description of the change, products and location of the change in the project.
  - 2. Supplementary or revised drawings and specifications.
  - 3. The projected time span for making the change and a specific statement as to whether overtime work is, or is not, authorized.
  - 4. A specific period of time during which the requested price will be considered valid.
  - 5. Such request is for information only and is not an instruction to execute the changes nor to stop work in progress.
- D. The Contractor shall not be entitled to any Additional Compensation for preparing a response to an RFP, whether ultimately accepted or not.

**1.08 CHANGE ORDER REQUEST ("COR")**

- A. Definition: A COR is a written request prepared by the Contractor asking the Owner and the Architect to incorporate a proposed change called for in an RFP or a claim into a Change Order.
- B. Changes in Price: Include breakdowns as required in the Article for FORMAT FOR CHANGE ORDER REQUEST to validate any change in Contract Price due to proposed change or claim.
- C. Changes in Time: A COR 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 the General Conditions and Division 1 of the Specifications.
- D. Scope of Costs: Within ten (10) days or such lesser period of time as may be required by Owner after a request is made for a change that impacts the Contract Sum or the Contract Time, provide to the Owner and the Architect in writing an estimate of the effect of the proposed Change upon the Contract Price and the actual cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing the following required for the change: actual quantities and unit prices of materials, labor hours, wage rates, the effect upon the Contract Time of such Change.
- E. Determination of Cost: The amount of the increase or decrease in the Contract Price resulting from a CO, if any, shall be determined in one or more of the following ways as applicable to a specific situation:
  - 1. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

2. Unit prices stated in the Contractor's original bid, the Contract Documents, or subsequently agreed upon between the Owner and the Contractor;
  3. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
  4. By cost of material and labor and percentage of overhead and profit.
- F. Determination of Costs by Material and labor and Percentage of overhead and profit: If the value is determined by this method the following requirements shall apply:
1. Daily Reports by Contractor.
    - a. General: At the close of each working day, the Contractor shall submit a daily report to the Inspector, on forms approved by the Owner, together with applicable delivery tickets, listing all labor, materials, and equipment involved for that day, the location of the Work, and for other services and expenditures when authorized concerning extra work items. An attempt shall be made to reconcile the report daily, and it shall be signed by the Inspector and the Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by subcontractors or others shall be submitted through the Contractor.
    - b. Labor: Show names of workers, classifications, and hours worked.
    - c. Materials: Describe and list quantities of materials used.
    - d. Equipment: Show type of equipment, size, identification number, and hours of operation, including, if applicable, loading and transportation.
    - e. Other Services and Expenditures: Describe in such detail as the Owner may require.
- G. Basis for Establishing Costs for Change Orders:
1. Labor will be the actual 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 insurance, 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.
  2. Labor Unit Productivity for a given task or trade shall not be calculated at a lesser productivity than that published by industry references as follows:
    - a. Mechanical Trades: SMACNA productivity rates increased by 30 percent (30 percent greater productivity for a given task than specified by the reference).
    - b. Electrical and Division 26 Trades: NECA productivity rates increased by 30 percent (30 percent greater productivity for a given task than specified by the reference).
    - c. All Other Trades: Lee Saylor Estimating Guide productivity using the "Open Shop Rate" for both labor and materials.
  3. Only costs for direct labor related to the Changed or Added Work shall be included. Supervision, Project Manager, Project Engineer, Assistant Superintendent, research and preparation of Change Order Requests and other similar classifications shall be included in the calculation for overhead and not listed separately as line items.
  4. 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.
  5. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.
  6. 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.

7. The Owner 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 Owner.
8. Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of \$100 or less.
9. 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.
10. 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.
11. Necessary loading and transportation costs for equipment used on the extra work shall be included. If equipment is used intermittently and, when not in use, could be returned to its rental source at less expense to the Owner 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 Owner.
12. Other Items. The Owner 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.
13. 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 Owner may establish the cost of the item involved at the lowest price which was current at the time of the Daily Report.
14. Overhead. Overhead, including direct and indirect costs shall be included in the line item amount shown in the Article FORMAT FOR PROPOSED COST CHANGE, shall be submitted with the COR and shall include all of the following:
  - a. Home office overhead,
  - b. Off-Site supervision,
  - c. Change Order and Change Order Request preparation/negotiation/research,
  - d. Schedule delays,
  - e. Project interference and disruption,
  - f. Additional guaranty and warranty durations,
  - g. On-Site supervision, additional temporary protection,
  - h. Additional temporary utilities,
  - i. Additional material handling costs,
  - j. Additional safety equipment costs.

H. Contractor's Certification:

1. All proposed change order requests, including those originated by the Contractor or those filed as claims, must include the following certification by the Contractor:

"The undersigned Contractor approves the foregoing as to the changes in work, if any, and as to the contract price specified for each item and as to the extension of time allowed, if any, for completion of the project as stated herein, and agrees to furnish all labor, materials, and service and to perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of claims which have no basis in fact or which Contractor knows are false are made at the sole risk of the Contractor and may be a violation of the False Claims Act, as set forth in Government Code Sections 12650 et seq. It is understood that the changes to the Contract Documents set forth herein shall only be effective upon approval by the governing board of the District.

"It is expressly understood that the value of the extra work or changes 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 herein are deemed waived."

2. All proposed change orders requests shall be submitted on forms included in this project manual. Change Order Requests submitted on the Contractor's forms, altered, modified, or incomplete forms will be deemed waived.

- I. Format for Change Order Request: The following format shall be prepared by the Contractor to communicate proposed additions and deductions to the Contract.

CHANGE ORDER REQUEST NO. \_\_\_\_\_

	ADDED	CREDIT
<b>GENERAL CONTRACTOR'S WORK</b>		
1. Material (attach itemized quantity and unit cost excluding sales tax)	_____	_____
2. Labor (attach itemized hours and rates)	_____	_____
3. Equipment (attach invoices)	_____	_____
4. Subtotal	_____	_____
5. General Contractor's Overhead and Profit, not to exceed fifteen percent (15%) of line 4.	_____	_____
6. Subtotal	_____	_____
7. Liability and Property Damage Insurance, Worker's Compensation Insurance, Social Security, and Unemployment Taxes, not to exceed thirty-three percent (33%) of line 2.	_____	_____
8. Subtotal General Contractor Work (sum of lines 6 and 7.)	_____	_____
<b>SUBCONTRACT WORK (Provide separate breakdown for each subcontract)</b>		
9. Material (attach itemized quantity and unit cost excluding sales tax)	_____	_____
10. Labor (attach itemized hours and rates)	_____	_____
11. Equipment (attach invoices)	_____	_____
12. Subtotal	_____	_____
13. Subcontractor's overhead and profit on work performed by Sub-contractor, not to exceed fifteen percent (15%) of line 12.	_____	_____
14. Subtotal	_____	_____
15. General Contractor's Overhead and Profit on subcontract work, not to exceed ten percent (10%) of line 14.	_____	_____
16. Liability and Property Damage Insurance, Worker's Compensation Insurance, Social Security, and Unemployment Taxes, not to exceed thirty-three percent (33%) of line 10.	_____	_____
17. Total of Subcontract Work (sum of lines 14, 15 and 16)	_____	_____
18. Subtotal General Contractor and Subcontractor Work (sum of lines 8 and 17.)	_____	_____
19. Applicable Taxes (itemized by levy and by contract)	_____	_____
20. Subtotal (sum of lines 18 and 19)	_____	_____
21. Bond not to exceed one and one half percent (1 1/2%) of line 20.	_____	_____
22. TOTAL (sum of lines 20 and 21.)	_____	_____

- J. 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 or expenses not included in the COR are deemed waived.
- K. Changes may be made by Owner by an appropriate written Change Order, or, at the Owner's option, such changes shall be implemented immediately upon the Contractor's receipt of an appropriate written directive.
- L. Notice required for Contractor-Initiated Change Order Requests: To request an increase in the Contract Price, or any extension in the Contract Time for completion, Contractor shall give the Owner and the Architect written notice thereof within ten (10) days after the occurrence of the event giving rise to the request, together with detailed estimates of the impact on the Contract Price and/or the Contract Time.
  - 1. This notice shall be given by the Contractor before proceeding to execute the Work.
  - 2. No request shall be considered unless made in accordance with this Article; however, the mere presentation of such claim shall not establish the validity of the cause giving rise to such request, or of the extension of the Contract Time, and/or the increase in the Contract Price.
  - 3. Contractor shall proceed to execute the Work even though the adjustment has been rejected or not agreed upon.
  - 4. Failure to provide the required notice within the stated time constitutes an express waiver of request.
  - 5. Any change in the Contract Price or extension of the Contract Time resulting from such request shall be authorized by a Change Order.

#### **1.09 CHANGE ORDERS ("CO")**

- A. No Changes Without Authorization;
  - 1. There shall be no change whatsoever in the drawings, specifications, or in the Work without an executed Change Order or an order by the Architect for a minor change in the Work as herein provided.
  - 2. Owner 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 same shall have been authorized by and the cost thereof approved in writing by Change Order.
  - 3. 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.
  - 4. 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.
  - 5. Notwithstanding anything to the contrary in this Article, all Change Orders shall be prepared and issued by the Architect and shall become effective when executed by the Owner, the Architect, the Contractor, and associated Construction Change Document (CCD) approved by DSA.
- B. Owner will designate in writing the person who is authorized to execute change orders.
- C. Contractor may initiate changes by submitting a written notice to Architect containing:
  - 1. Description of the proposed changes.

2. Statement of the reason for making the changes.
  3. Statement of the effect on the contract sum and the contract time.
  4. Statement of the effect on the work of separate contractors.
  5. Documentation supporting any change in contract sum or contract time as appropriate.
- D. A Change Order is a written instrument prepared by the Architect and signed by the Owner, the Contractor, and the Architect stating their agreement upon all of the following:
1. 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.
- E. The following paragraph shall be a part of each Change Order:
1. The compensation (time and cost) set forth in this Change Order comprises the total compensation due the Contractor, all Subcontractors and all Suppliers, at all tiers, for the work or change defined in the Change Order, including all impact on unchanged work. By signing this Change Order the Contractor acknowledges and agrees, on behalf of themselves, all Subcontractors and all Suppliers, at all tiers, that the stipulated compensation includes payment for all work contained in the Change Order, plus all payment for the interruption of schedules, extended and unabsorbed overhead costs, delay, disruption, and all impact, ripple impact or cumulative impact on all other work under this Contract. The signing of the Change Order indicates that the Change Order constitutes full mutual accord and satisfaction for the changed work, and that the time and cost under the Change Order constitutes the total equitable adjustment owed the Contractor, all Subcontractors and all Suppliers, at all tiers, as a result of the change. The Contractor, on behalf of themselves, all Subcontractors and all Suppliers, at all tiers, agrees to waive all rights, without exception or reservation of any kind whatsoever to file any further claim related to this Change Order. No further claim or request for equitable adjustment of any kind whatsoever shall arise out of or as a result of this change or the impact of this change on the remainder of the work under this Contract.
- F. For a "close out" Change Order (i.e., the final Change Order on the project), add the following paragraph.
1. By execution of this Change Order the Contractor specifically waives, relinquishes, and releases any and all rights under Section 1542 of the California Civil Code which reads as follows:  
  
"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR."

#### **1.10 EXECUTION OF CHANGE ORDERS**

- A. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- B. Transmittal and Distribution:
  1. Architect will prepare and execute the Change Order and forward to Contractor.



2. Contractor shall execute the Change Order and forward to Architect. Architect will forward Change Order to Owner.
3. Owner will execute the Change Order and forward to the Architect.

#### **1.11 CORRELATION OF CONTRACTOR SUBMITTALS**

- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum/Price.
- B. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- C. Promptly enter changes in Project Record Documents.

#### **PART 2 PRODUCTS**

Not Used.

#### **PART 3 EXECUTION**

##### **3.01 ELECTRONIC PROCESSING PROCEDURES**

- A. Modification requests shall be transmitted to the Architect using the project's cloud-based file sharing and storage service ("project's website") with electronic, editable (PDF) format attachments, as required. The cloud-based file sharing and storage service will be selected by the Architect. Contractor's failure to utilize, provide entries and processing through the Architect's cloud-based system will subject Contractor to hourly back charges associated with efforts required by others to perform work which is the contractual responsibility of the Contractor.
- B. Contractor's cost related to use of the project's website services shall be included in the Contractor's bid.
- C. Provide hardcopy submittals if requested by Architect.
- D. The Architect's review comments and/or direction will be made available on the project's website for downloading.
- E. Contractor will distribute a hardcopy of all reviewed request and direction to the Inspector of Record, Owner, and Construction Manager.

**END OF SECTION**

(MODIFICATION PROCEDURE FORMS FOLLOW)

REQUEST FOR INFORMATION  
ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS

REQUEST FOR PROPOSAL  
POTENTIAL CHANGE ORDER  
CHANGE ORDER



-O-1.4

**Request for Information**

Detailed, RFIs without Routing Information Grouped by RFI Number

Project Number:  
 DSA Application:  
 DSA File:

**Date Created:**

Answer Company	Answered By	Author Company	Authorized By
Quattrocchi Kwok Architects 636 5th Street Santa Rosa, CA 95404			

Co-Respondent	Author RFI Number

Subject	Discipline	Category

Cost Impact	Amount	Schedule Impact	Days	Drawing Impact
			0	

Cost Impact Comments	Schedule Impact Comments	Drawing Impact Comments

**Drawing/Specification Section Reference:**

Question	Date Required:

**Suggestion**

Answer	Date Answered:



-O-1.5

## Architect's Supplemental Instruction

Detailed, Grouped by Each Number

---

Project Number:  
DSA Application:  
DSA File:

**Number:**

**Date:**

**To:**

**From:**

Quattrocchi Kwok Architects

636 5th Street  
Santa Rosa, CA 95404

**Subject**

**Reference Drawing/Detail**

**Attachments**

**Description**



-O-1.6

## Request for Proposal

---

Project Number:  
DSA Application:  
DSA File:

---

### **RFP** \_\_

Please submit an itemized proposal for changes in the Contract Sum or Contract Time for proposed modifications to the Contract Documents described herein. Submit proposal within ten (10) days or notify the Architect in writing of the date on which you anticipate submitting your proposal. Proposal shall include all impacts related to this change and contractor is due no further completion than represented by proposal for change or any impacts related to change.

THIS IS NOT A CHANGE ORDER OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED IN THE PROPOSED MODIFICATIONS.

Please provide itemized pricing for the following description of work:

### **Attachments:**



Potential Change Orders

Detailed, Grouped by Each Number

Project Number:  
 DSA Application:  
 DSA File:

PCO Number:	Title:	Status:
Date Created	Reference	
Full Description		
Schedule Adjustment		
Requested Days	Approved Days	
Price Adjustment		
Proposed Amount	Approved Amount	Applied Amount

PROJECT:

Project No.: \_\_\_\_\_  
Date: \_\_\_\_\_  
DSA App. No.: \_\_\_\_\_  
Page \_\_\_\_\_  
of \_\_\_\_\_

Line TITLE: ADDED CREDIT

---

ALL LINES SHALL BE FILLED IN, (zero values acceptable).

**GENERAL CONTRACTOR'S WORK**

1	Material (attach itemized quantity and unit cost <u>excluding</u> sales tax)	_____	_____
2	Labor (attach itemized hours and rates)	_____	_____
3	Equipment (attach invoices)	_____	_____
4	<b>Subtotal</b>	_____	_____
5	General Contractor's Overhead and Profit, not to exceed fifteen percent (15%) of line 4.	_____	_____
6	<b>Subtotal</b>	_____	_____
7	Liability and Property Damage Insurance, Worker's Compensation Insurance, Social Security, and Unemployment Taxes, not to exceed thirty-three percent (33%) of line 2.	_____	_____
8	<b>Subtotal</b> General Contractor Work (sum of lines 6 and 7.)	_____	_____

**SUBCONTRACT WORK** (Provide separate breakdown for each subcontract)\*

9	Material (attach itemized quantity and unit cost <u>excluding</u> sales tax)	_____	_____
10	Labor (attach itemized hours and rates)	_____	_____
11	Equipment (attach invoices)	_____	_____
12	<b>Subtotal</b>	_____	_____
13	Subcontractor's overhead and profit on work performed by Sub-contractor, not to exceed fifteen percent (15%) of line 12.	_____	_____
14	<b>Subtotal</b>	_____	_____
15	General Contractor's Overhead and Profit on subcontract work, not to exceed ten percent (10%) of line 14.	_____	_____
16	Liability and Property Damage Insurance, Worker's Compensation Insurance, Social Security, and Unemployment Taxes, not to exceed thirty-three percent (33%) of line 10.	_____	_____
17	<b>Total</b> of Subcontract Work (sum of lines 14, 15 and 16)	_____	_____
18	<b>Subtotal</b> General Contractor and Subcontractor Work (sum of lines 8 and 17.)	_____	_____
19	Applicable Taxes (itemized by levy and by contract)	_____	_____
20	<b>Subtotal</b> (sum of lines 18 and 19)	_____	_____
21	Bond not to exceed one and one half (1 1/2%) of line 20.	_____	_____
22	<b>TOTAL</b> (sum of lines 20 and 21.) Copy to cover page.	_____	_____

\* Attach additional copies of this page as required to summarize additional subcontracts.

# CHANGE ORDER

	Distribution to
<input checked="" type="checkbox"/>	OWNER
<input checked="" type="checkbox"/>	ARCHITECT
<input checked="" type="checkbox"/>	CONTRACTOR
<input checked="" type="checkbox"/>	IOR (copy)
<input checked="" type="checkbox"/>	ORS
<input type="checkbox"/>	

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PROJECT	Change Order No.	Zero (00)
	Project No.	
	Initiation Date:	
	Contract For:	
	Contract Date	
CONTRACTOR	ORS File No.	
	ORS App. No.	
	OPSC App. No.	

You are directed to make the following changes in this contract: (Refer to Attached Summary)

*Reserved for Architect's Stamp*

*Reserved for DSA/ORS Approval Stamp*

The original Contract Sum was	_____
Net change by previous Change Orders	_____
The Contract Sum prior to this Change Order was	_____
The Contract Sum will be UNCHANGED by this Change Order in the amount of	_____
The new Contract Sum including this Change Order will be	_____
The Contract Time will be UNCHANGED by this Change Order in the amount of	_____
The Date of Completion as of the date of this Change Order:	_____

**Not valid until signed by both the Owner and the Architect.**

Signature of the contractor indicates his approval herewith, including any adjustment in the Contract Sum or Contract Time.

The compensation (time and cost) set forth in this Change Order comprises the total compensation due the Contractor, all Subcontractors and all Suppliers, at all tiers, for the work or change defined in the Change Order, including all impact on unchanged work. By signing this Change Order the Contractor acknowledges and agrees, on behalf of themselves, all Subcontractors and all Suppliers, at all tiers, that the stipulated compensation includes payment for all work contained in the Change Order, plus all payment for the interruption of schedules, extended and unabsorbed overhead costs, delay, disruption, and all impact, ripple impact or cumulative impact on all other work under this Contract. The signing of the Change Order indicates that the Change Order constitutes full mutual accord and satisfaction for the changed work, and that the time and cost under the Change Order constitutes the total equitable adjustment owed the Contractor, all Subcontractors and all Suppliers, at all tiers, as a result of the change. The Contractor, on behalf of themselves, all Subcontractors and all Suppliers, at all tiers, agrees to waive all rights, without exception or reservation of any kind whatsoever to file any further claim related to this Change Order. No further claim or request for equitable adjustment of any kind whatsoever shall arise out of or as a result of this change or the impact of this change on the remainder of the work under this Contract.

**By execution of this Change Order the Contractor specifically waives, relinquishes, and releases any and all rights under Section 1542 of the California Civil Code which reads as follows:**

"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY EFFECTED HIS SETTLEMENT WITH THE DEBTOR."

ARCHITECT	CONTRACTOR	OWNER
<b>QUATTROCCHI KWOK ARCHITECTS</b>		
636 Fifth St.		
Santa Rosa, CA 95404		
By.	By.	By.
Date	Date	Date



SUMMARY OF ATTACHMENTS TO:

PROJECT

0  
0

Change Order No. Zero (00)

Project No. \_\_\_\_\_

Contract For: \_\_\_\_\_

ORS App. No. \_\_\_\_\_

The Time for Milestone 1 will be UNCHANGED by this Change Order in the amount of \_\_\_\_\_

The Date of Milestone 1 as of the date of this Change Order therefore is \_\_\_\_\_

The Time for Milestone 2 will be UNCHANGED by this Change Order in the amount of \_\_\_\_\_

The Date of Milestone 2 as of the date of this Change Order therefore is \_\_\_\_\_

No.	Reference:	Description:	C.O.R. #	Request by:	Amount	Calendar Days Added to Contract					
						DoC	M1	M2	M3		
<b>TOTALS:</b>						\$	-	0	0	0	0
1.											
2.											
3.											
4.											
5.											
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32.											
33.											
34.											
35.											
END OF SUMMARY											

## SECTION 01 2900

### APPLICATIONS FOR PAYMENT

#### PART 1 GENERAL

##### 1.01 DESCRIPTION

- A. Payment Procedures:
  - 1. Schedule of Values.
  - 2. Applications for Payment.
  - 3. Conditions of Payment.
  - 4. Final Payment.
  - 5. Contractor Submittals.
  
- B. Related Documents
  - 1. Document - Contract (Agreement Between Owner and Contractor): Lump Sum.
  - 2. Document - General Conditions: Progress Payments, Retainages and Final Payment, Applicability of Labor Compliance Program.
  - 3. District Labor Compliance Program, as applicable to the project.
  - 4. Section 01 2600 - Modification Procedures: Change Orders.
  - 5. Section 01 3900 - Coordination and Meetings.
  - 6. Section 01 3300 - Submittals: Submittal procedures.
  - 7. Section 01 3200 - Construction Progress Schedules.
  - 8. Section 01 7000 - Contract Closeout: Final payment.

##### 1.02 SUBMITTALS

- A. On forms approved by the Owner, the Contractor shall furnish the following:
  - 1. Within ten (10) days of the award of the Contract, a detailed breakdown of the Contract Price (Schedule of Values) for each Project or Site;
  - 2. Within ten (10) days of the award of the Contract, a schedule of estimated monthly payment requests (cash flow) 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 Owner may require;
  - 3. Within ten (10) days, the name, address, telephone number, fax number, license number, and classification of all of its Subcontractors and of all other parties furnishing labor, material, or equipment for its Contract, along with the amount of each such subcontract or the price of such labor, material, and equipment needed for its entire portion of the Work.
  - 4. Five (5) days prior to the submission of a pay request, an itemized breakdown of work done for the purpose of requesting partial payments;
  - 5. Five (5) days prior to the submission of a pay request, the minutes of Coordination Meetings per Section 01 3900.
  - 6. Five (5) days prior to the submission of a pay request, updated Construction Progress Schedule per Section 01 3100.

7. For all public works projects subject to prevailing wage requirements of the Labor Code: submittal of electronic certified payroll records to the State Labor Commissioner maintained on a weekly basis, as required (Labor Code Section 1776), and penalties for failure to do so (Labor Code Section 1776(g)); The requirement includes and applies to all subcontractors performing work on projects even if their portion of the work is less than one half of one percent of the total amount of the contract.
- B. Owner Approval Required
1. The Owner shall review all submissions received pursuant to paragraph 1.03 A. in a timely manner. All submissions must be approved by the Owner before becoming the basis of any payment.
- C. Submit itemized applications typed on Application and Certificate for Payment and Continuation Sheet.
- D. Provide itemized data on continuation sheet:
1. Format, schedules, line items and values: Those of the Schedule of Values accepted by Architect.
- E. Obtain signature of Owner's Inspector on Application for Payment Continuation Sheet with each application prior to submittal to Architect.

### **1.03 SCHEDULE OF VALUES**

- A. The Schedule of Values shall be used only as the basis for the Contractor's Progress Payments.
- B. Upon request of the Architect, support the values with data which will substantiate their correctness.
- C. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
1. Contractor's construction schedule.
  2. Application for Payment form.
  3. List of subcontractors
  4. List of products.
  5. List of principal suppliers and fabricators.
  6. Schedule of submittals.
- D. Form of Schedule: Submit schedule on Application for Payment Continuation Sheet. Identify schedule with;
1. Title of Project and location, and name of Owner.
  2. Architect and Architect's Project Number.
  3. Name and address of Contractor.
  4. Contract designation.
  5. Date of submission.
- E. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction. Modify detail as requested by Architect.
- F. Follow the table of contents of this Project Manual as the form for listing component items.

1. Identify each line item with the number and title of the respective section of the specifications.
  2. Include separate line items for each section of Division 01.
- G. For each major line item which has installed value of more than \$10,000.00, list sub-values of major products or operations under the item.
- H. For the various portions of the Work:
1. Itemize separate line item cost for each of following general cost items (if provided):
    - a. Performance and payment bonds.
    - b. Field supervision and layout.
    - c. Temporary facilities and controls.
    - d. Mobilization.
  2. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
  3. For items on which progress payments will be requested for stored materials, break down the value into:
    - a. The cost of the materials, delivered and unloaded, with taxes paid.
    - b. The total installed value.
- I. The sum of all values listed in the schedule shall equal the total Contract Sum.

#### **1.04 APPLICATIONS FOR PAYMENT**

- A. Procedure: On or before the twenty-fifth (25th) day of each calendar month during the progress of the portion of the Work for which payment is being requested, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the Schedule of Values. Such application shall be notarized if the project is subject to a Labor Compliance Program, or if directed by the Owner for projects not subject to as Labor Compliance Program, and supported by all of the following, or such portion thereof as Architect requires:
1. The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;
  2. The amount being requested with the Application for Payment 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 Record Drawings and Annotated Specifications are current;
  5. The additions to and subtractions from the Contract Price and Time;
  6. A summary of the retentions (each Application shall provide for retention, as set forth above, of the amount due until completion of the Work of the Contractor and Final Acceptance thereof by Owner);
  7. Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the Owner may require from time to time;
  8. The percentage of completion of the Contractor's Work by line item; and
  9. A statement showing all payments made by the Contractor for labor and materials on account of the Work covered in the preceding Application for Payment.
- B. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
  2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
  3. Execute certification with signature of a responsible officer of Contract firm.
- C. Continuation Sheets:
1. Fill in total list of all scheduled component items of Work, with item number and scheduled dollar value for each item.
  2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored.
  3. List each Change Order executed prior to date of submission, at the end of the continuation sheets.
    - a. List by Change Order Number, and description, as for an original component item of work.
- D. Purchase of Materials and Equipment: 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 Owner. Therefore, payment by the Owner for stored material shall be made only in unusual circumstances where the Architect specifically recommends, and Owner specifically approves, the payment in writing.  
Payments made on account of materials and equipment not incorporated in the Work shall be conditioned upon submission by the Contractor, Subcontractor, or vendor of:
- a. bills of sale and such other documents satisfactory to the Architect and the Owner to establish the Owner's title to such materials or equipment free of all liens and encumbrances, and otherwise protect the Owner's interest, and:
  - b. including, without limitation, provision of applicable insurance and transportation to the Site.
2. All stored items shall be inventoried, specified by identification numbers (if applicable), released to the Owner by sureties of the Contractor and the Subcontractor and delivered and suitably stored at the Site or at some other location agreed upon in writing by the Owner, if stored off-Site, stored only in a bonded warehouse.
- E. Warranty of Title: The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, 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.
- F. Progress Payments:
1. Payments to Contractor

- a. Within thirty (30) days after approval of the Request for Payment, Contractor shall be paid a sum equal to ninety five (95) percent of the value of the Work performed up to the last day of the previous month unless a different retention percentage is stated in the Notice Inviting Bids, in which case that percentage applies, less the aggregate of previous payments. The value of the Work completed shall be an estimate only, no inaccuracy or error in said estimate shall operate to release the Contractor, or any bondsman, from damages arising from such Work or from enforcing each and every provision of this Contract, and the Owner shall have the right subsequently to correct any error made in any estimate for payment.
  - b. 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 Owner concerning the Work, or any portion thereof, remains uncomplished with. At any time after fifty percent (50%) of the Work has been completed, if the Owner, by action of its governing body, finds that satisfactory progress is being made, the Owner may make any of the remaining payments in full for actual work completed or may withhold any amount up to ten percent (10%) thereof as the Owner may find appropriate based on the Contractor's progress.
2. Payments to Subcontractors: No later than ten (10) days after receipt, 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, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.
  3. Percentage of Completion or Payment Information: The Owner will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor, and action taken thereon by the Owner, on account of portions of the Work done by such Subcontractor.
  4. No Obligation of Owner for Subcontractor Payment: The Owner 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.
  5. Payment to Suppliers: Payment to material or equipment suppliers shall be treated in a manner similar to that provided in paragraphs 1.05 F. 2., 3. and 4.
  6. Payment Not Constituting Approval or Acceptance: An approved Request for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of work not in accordance with the Contract Documents.
  7. Joint Checks: Owner shall have the right, if necessary for the protection of the Owner, to issue joint checks made payable to the Contractor and Subcontractors and/or 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 Owner and a Subcontractor of any tier, any obligation from the Owner to such Subcontractor, or rights in such Subcontractor against the Owner.
- G. Labor Compliance: A determination regarding whether this project is subject to prevailing wage requirements of the Labor Code is included in the Instructions to Bidders. Further information is contained in the General Conditions. The Contractor is responsible for enforcement of the terms and conditions of the Labor Code, including electronic certified payroll reporting and posting job site notices prescribed by regulation.

### 1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. Each and every Application for Payment shall be accompanied with the complete substantiating data specified in this Section in the article titled CONDITIONS OF PAYMENT.
- B. When the Owner or the Architect requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:
  - 1. Project.
  - 2. Application number and date.
  - 3. Detailed list of enclosures.
  - 4. For stored products:
    - a. Item number and identification as shown on application.
    - b. Description of specific material.

### 1.06 COMPLETION AND FINAL PAYMENT

- A. Final Inspection
  - 1. Contractor shall immediately upon receipt of the Punch List, initiate work on all items therein related to Contractor's Work and diligently complete the same. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and acceptance, Architect shall inspect the Work and shall submit to Contractor and Owner a final inspection report noting the work, if any, required in order to complete the Work in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed.
  - 2. Upon completion of the Work contained in the final inspection report, the Contractor shall so notify the Owner, who shall again inspect such Work. If the Owner finds the Work contained in such final inspection report acceptable under the Contract Documents and, therefore, the Work fully completed, it shall so notify Contractor, who shall then submit to the Architect its final Application for Payment.
  - 3. Upon receipt and approval of such final Application for Payment, the Architect shall issue a final Certificate of Payment 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 Owner 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 Owner shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of payment from Owner, pay the amounts due Subcontractors.
- B. Retainage: The retainage, less any amounts disputed by the Owner or which the Owner has the right to withhold, shall be paid after approval of the Owner of the Architect's Certificate of Payment referred to in paragraph 1.07 A., after the satisfaction of the conditions set forth in paragraph 1.07 C., and after thirty-five (35) days after the acceptance of the Work and recording of the Notice of Completion by Owner. 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.

- C. Procedures for Application for Final Payment: The Application for Final Payment shall be accompanied by the same details as set forth in paragraph 1.05, and in addition, the following conditions must be fulfilled:
1. A full and final waiver of all liens in connection with the Work shall be submitted by Contractor, including a release of lien in recordable form, together with (to the extent permitted by law) a copy of the full and final waiver of all liens, including a release of lien in recordable form, in connection with the Work obtained by Contractor from each person to receive a payment thereunder, which waivers of lien shall be in a form as approved by Owner.
  2. The Contractor shall have made, or caused to have been made, all corrections 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 Owner required under the Contract.
  3. Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work.
  4. The Contractor shall deliver to the Owner reproducible final Record Drawings and Annotated Specifications showing the Contractor's Work "as built," with the Contractor's certification of the accuracy of the Record Drawings and Annotated Specifications, all guarantees, and operation and maintenance instructions for equipment and apparatus.
  5. Architect shall have issued a Final Certificate of Payment.
  6. The Contractor shall have delivered to the Owner all manuals and materials required by the Contract Documents.
  7. The Contractor shall have removed, or caused to be removed, all waste materials and rubbish from and about the Site, as well as all tools, construction equipment, machinery, surplus material, scaffolding equipment, and any other similar materials of the Contractor or any subcontractor, shall have cleaned, or caused to be cleaned, all glass surfaces, and shall have left the Work broom-clean, except as otherwise provided in the Contract Documents.
- D. Fill in Application form as specified for progress payments and present the final statement of accounting.
- E. Use continuation sheet for presenting the final statement of accounting as specified in Section 01 7000 - Contract Closeout.
- F. Fill out and submit with application for final payment:
1. Contractor's Affidavit of Payment of Debts and Claims.
  2. Contractor's Affidavit of Release of Liens.
  3. Consent of Surety Company to Final Payment.
  4. Release Form 3 Conditional Waiver and Release Upon Final Payment.
- G. Fill out and submit to Owner prior to receipt of final payment: Release Form 4 Unconditional Waiver and Release Upon Final Payment

#### **1.07 SUBMITTAL PROCEDURE**

- A. Submit Applications for Payment to Architect at the times stipulated in the Agreement.



- B. Number: Five copies of each Application, or four copies in addition to number required by Contractor.
- C. Each Application shall include all of the items listed in the Article titled CONDITIONS OF PAYMENT.

#### 1.08 CONDITIONS OF PAYMENT

- A. Contractor submittal of the following items attached to the Application for Payment Transmittal following this Section with original signature of the Contractor's Project Superintendent, with each and every Application for Payment is a condition precedent to receipt of payment.
  1. Certification of Review of Payment Application by original signature on the Application for Payment Transmittal of Contractor's Superintendent. This document shall be counter-signed signifying review and approval by Owner's Inspector of Record.
  2. Application for Payment with schedule of values for the period during which Work was performed.
  3. Completed Daily Reports for the applicable billing period. Contractors shall maintain daily records of their activities, subcontractors present, number of workers representing each subcontractor, number of workers employed by the Contractor, and any other information deemed pertinent by the Contractor. Architect is not required to review or comment on this information.
  4. Completed Schedule Update for the applicable billing period, with all attachments as may be required by Section 01 3100 for that submittal.
  5. Provide Certification by original notarized signature of Contractor's Project Superintendent on the Application for Payment Transmittal that the project is on schedule and that the Contractor has experienced no delays or schedule disruptions.
    - a. In the event that a Contractor has experienced delay or disruption in the period for which payment is applied, Contractor must so indicate in writing with original signature on Contractor's company letterhead attached to this certification stating the nature of the delay or disruption, the event that precipitated said delay, and the method of recovering the lost time and maintaining the schedule recommended by the Contractor. Failure to so timely indicate delay or disruption shall be construed as a waiver of claim for damages for same.
  6. Certification by original notarized signature of Contractor's Project Superintendent on the Application for Payment Transmittal that Contractor has updated all As-Built Drawings in the Project Superintendent's office.
  7. Completed Conditional Waiver and Release Upon Progress Payment Forms for the Contractor and any and all Subcontractors, second and third tier subcontractors and material suppliers or service providers.
  8. Completed Unconditional Waiver and Release Upon Progress Payment Forms for previous billing period, if any. Contractor to provide one Unconditional Waiver and Release Upon Progress Payment for every corresponding Conditional Waiver and Release submitted with previous Application for Payment.
  9. Copy of Verified Report Form SSS 6, as required during the applicable billing period.
- B. When Architect finds Application and all required submittal attachments properly completed and correct, he or she will transmit Certificate for Payment to Owner, with copy to Contractor. Incomplete or improper submittals will be returned to the Contractor without action.

#### 1.09 REVIEW OF PROGRESS PAYMENT

- A. Owner Approval: The Architect will, within seven (7) days after receipt of the Contractor's Application for Payment, either certify such payment or notify the Contractor in writing of the Architect's reasons for withholding certification in whole or in part as provided above.
- B. Architect's Review: The review of the Contractor's Application for Payment by the Architect is based on the Architect's observations at the Site 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. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion, and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the review by the Architect will not be a representation that the Architect has:
1. Made exhaustive or continuous on-Site inspections to check the quality or quantity of the Work;
  2. Reviewed construction means, methods, techniques, sequences, or procedures;
  3. Reviewed copies of requisitions received from Subcontractors, material and equipment suppliers, and other data requested by the Owner to substantiate the Contractor's right to payment; or
  4. Made an examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.
  5. Reviewed or examined for accuracy or completeness any documentation submitted to comply with the Owner's Labor Compliance Program.

#### **1.10 DECISIONS TO WITHHOLD PAYMENT**

- A. Reasons to Withhold Payment: The Owner may decide to withhold payment in whole, or in part, to the extent reasonably necessary to protect the Owner if, in the Owner's opinion, the representations to the Owner required by the Article titled REVIEW OF PROGRESS PAYMENT cannot be made. The Owner may withhold payment, in whole, or in part, to such extent as may be necessary to protect the Owner from loss because of:
1. Defective Work not remedied;
  2. Stop Notices filed, unless the Contractor at its sole expense provides a bond or other security satisfactory to the Owner in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the Owner, which protects the Owner against such claims;
  3. Liquidated damages assessed against the Contractor;
  4. Reasonable doubt that the Work can be completed for the unpaid balance of any Contract Price or by the completion date;
  5. Damage to the Owner, another contractor, or subcontractor;
  6. Unsatisfactory prosecution of the Work by the Contractor;
  7. Failure to store and properly secure materials;

8. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders, and verified reports, certifications, certified payrolls, any submittals required by the Labor Compliance Program but not enumerated in this or other sections of these specifications, as applicable, and other submittals specified as conditions precedent to receipt of payment in the Article titled CONDITIONS OF PAYMENT;
  9. Failure of the Contractor to maintain record drawings;
  10. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;
  11. Unauthorized deviations from the Contract Documents; or
  12. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and completion dates.
  13. Failure of the Contractor to conform to the requirements of the Labor Compliance Plan as applicable.
- B. Written Reasons for Withholding Provided: Upon request of the Contractor whose payment is deferred, the Contractor shall be given a written copy of Owner's reasons for withholding payment.
- C. 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.
- D. Labor Compliance Penalties: In addition to the remedy of withholding payment, the Owner may assess penalties as described in the Labor Compliance Program or as otherwise required by law for failure of the Contractor to conform to the requirements of the Labor Compliance Plan.

#### 1.11 SUBSTITUTION OF SECURITIES

- A. In accordance with § 22300 of the Public Contract Code, the Owner will permit the substitution of securities for any monies withheld by the Owner to ensure performance under the Contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Owner, or with a state or federally chartered bank as the escrow agent, who shall then pay such monies to the Contractor. Upon satisfactory completion of the Contract, the securities shall be returned to the Contractor.
- B. Securities eligible for investment under this section shall include those listed in Government Code § 16430, bank or savings and loan certificates of deposit, interest-bearing, demand-deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the Owner.
- C. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.
- D. The escrow agreement used for the purposes of this Section shall be substantially similar to the form set forth in Public Contract Code § 22300.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

(APPLICATION FOR PAYMENT FORMS FOLLOW)  
APPLICATION FOR PAYMENT TRANSMITTAL  
APPLICATION AND CERTIFICATE FOR PAYMENT  
APPLICATION FOR PAYMENT CONTINUATION SHEET  
CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS  
CONTRACTOR'S AFFIDAVIT OF RELEASE OF LEINS  
CONSENT OF SURETY TO FINAL PAYMENT  
RELEASE FORMS 1 THROUGH 4

WHEN NOTED IN THE GENERAL CONDITIONS AS PART OF THE PROJECT,  
DISTRICT LABOR COMPLIANCE PROGRAM WILL BE  
BOUND FOLLOWING THIS SECTION

RELEASE FORM 1  
CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT  
(Civil Code Sec. 8132)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT’S LIEN, STOP PAYMENT NOTICE, AND  
PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY  
ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

**Identifying Information**

Name of Claimant: .....

Name of Customer: .....

Job Location: .....

Owner: .....

Through Date: .....

**Conditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant’s receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: .....

Amount of Check: \$ .....

Check Payable to: .....

**Exceptions**

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:  
Date(s) of waiver and release: .....

Amount(s) of unpaid progress payment(s): \$ .....

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

**Signature**

Claimant’s Signature: .....

Claimant’s Title: .....

Date of Signature: .....

RELEASE FORM 2

UNCONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

(Civil Code Sec. 8134)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

**Identifying Information**

Name of Claimant: .....

Name of Customer: .....

Job Location: .....

Owner: .....

Through Date: .....

**Unconditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment:

\$ .....

**Exceptions**

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

**Signature**

Claimant's Signature: .....

Claimant's Title: .....

Date of Signature: .....

RELEASE FORM.3

CONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT  
(Civil Code Sec. 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT’S LIEN, STOP PAYMENT NOTICE, AND  
PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY  
ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

**Identifying Information**

Name of Claimant: .....

Name of Customer: .....

Job Location: .....

Owner: .....

**Conditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant’s receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: .....

Amount of Check: \$ .....

Check Payable to: .....

**Exceptions**

This document does not affect any of the following:

Disputed claims for extras in the amount of: \$ .....

**Signature**

Claimant’s Signature: .....

Claimant’s Title: .....

Date of Signature: .....

RELEASE FORM 4

UNCONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT  
(Civil Code Sec. 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

**Identifying Information**

Name of Claimant: .....

Name of Customer: .....

Job Location: .....

Owner: .....

Through Date: .....

**Unconditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

**Exceptions**

This document does not affect the following:

Disputed claims for extras in the amount of: \$ .....

**Signature**

Claimant's Signature: .....

Claimant's Title: .....

Date of Signature: .....



# APPLICATION FOR PAYMENT TRANSMITTAL

Distribution to:

<input checked="" type="checkbox"/>	OWNER
<input checked="" type="checkbox"/>	ARCHITECT
<input type="checkbox"/>	CONTRACTOR
<input checked="" type="checkbox"/>	INSPECTOR
<input type="checkbox"/>	

Distribution By: \_\_\_\_\_ - O - 1.11

**A4P**

<input checked="" type="checkbox"/>	FAX
<input checked="" type="checkbox"/>	MAIL
<input type="checkbox"/>	OVERNIGHT
<input type="checkbox"/>	HAND DELIVERY
<input type="checkbox"/>	

P:\ProjectNo.ProjectName\Files\IO-CA\11-A4PLCPv2.0\4/2003

PROJECT: 0 0 0 0	ARCHITECT: <b>Quattrocchi Kwok Architects</b> 636 Fifth Street Santa Rosa, CA 95404 Fax 707-576-0295	Application No. _____ Date: _____ Arch. Project No.: <u>0</u> Contract For: <u>Increment 1</u> Contract Date: <u>1/0/1900</u> DSA File No.: <u>0.00</u> DSA App. No.: <u>0</u> OPSC App. No.: <u>0</u> Contr. Project No.: _____
OWNER: 0 0 0	Inspector of Record 0 0 0	
Fax: <u>0</u>	Fax <u>0</u> Phone: <u>0</u>	

The following documents are attached to this transmittal, in accordance with Section 01027 - Applications for Payment. This certification must accompany each Application for Payment.

- |   |                                                                                                      |                    |
|---|------------------------------------------------------------------------------------------------------|--------------------|
| 1 | Application for Payment and Schedule of Values (AIA Forms G702 and G703)                             | Completed (signed) |
| 2 | Contractor's Certified Payroll Report for billing period electronically submitted to DIR.            | _____              |
| 3 | Contractor's Complete Daily Logs for billing period noted.                                           | _____              |
| 4 | Completed Schedule update for the billing period noted.                                              | _____              |
| 5 | Complete Conditional Waiver and and Release upon Progress Payment form.                              | _____              |
| 6 | Complete Unconditional Waiver and Release upon Progress Payment Form for month preceding.            | _____              |
| 7 | Original signature copies of DSA SSS-6 Verified Report Form (required for Release of Final Payment). | _____              |

**INSPECTOR:**

The undersigned has reviewed the attached Application for Payment and finds it representative of the work completed and material stored at the site. I recommend that the Architect certify and the District process payment to the Contractor as noted on the Application for Payment.  
All the above prerequisites for Progress Payment have been met by the Contractor.

0  
0  
0

By. \_\_\_\_\_  
original signature required

Date: \_\_\_\_\_

**CONTRACTOR:**

The undersigned certifies under penalty of perjury that the attached submittals are complete and correct; that the project is on schedule and has experienced no delays or disruption through the date of this transmittal except as shown on the attached Project Schedule of same date; and the Record drawings have been maintained and updated in accordance with the Contract Documents through the period as shown on the attached Application for Payment.

0 By. \_\_\_\_\_  
0 original signature required  
0 Date: \_\_\_\_\_

State of: \_\_\_\_\_  
County of: \_\_\_\_\_  
Subscribed and sworn to  
before me this \_\_\_\_ day of \_\_\_\_  
Notary Public:  
My Commission expires: \_\_\_\_\_ Notary Stamp Above  
Notary stamp required for projects with Labor Compliance Program

NOTE: All required original signatures must be affixed before processing of Application by the Architect.  
Incomplete applications may be returned without action.

# Application and Certificate for Payment

TO OWNER: PROJECT: APPLICATION NO.: DISTRIBUTION TO:  
 PERIOD TO: Owner   
 CONTRACT FOR: Architect   
 CONTRACT DATE: Contractor   
 PROJECT NOS.: Field   
 Other

FOR CONTRACTOR: VIA ARCHITECT:

## CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet is attached.

- 1. ORIGINAL CONTRACT SUM \$ \_\_\_\_\_
- 2. NET CHANGE BY CHANGE ORDERS \$ \_\_\_\_\_
- 3. CONTRACT SUM TO DATE (line 1 + 2) \$ \_\_\_\_\_
- 4. TOTAL COMPLETED & STORED TO DATE (column G) \$ \_\_\_\_\_

### 5. RETAINAGE:

- a. \_\_\_\_% of Completed Work \$ \_\_\_\_\_  
(Columns D & E)
- b. \_\_\_\_% of Stored Material \$ \_\_\_\_\_  
(Column F)

Total Retainage (Lines 5a + 5b)

- 6. TOTAL EARNED LESS RETAINAGE \$ \_\_\_\_\_

(Line 4 minus Line 5 Total)

- 7. LESS PREVIOUS CERTIFICATES FOR PAYMENTS \$ \_\_\_\_\_

(Line 6 from prior Certificate)

- 8. CURRENT PAYMENT DUE \$ \_\_\_\_\_

- 9. BALANCE TO FINISH, INCLUDING RETAINAGE \$ \_\_\_\_\_

(Line 3 minus Line 6)

## ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$ \_\_\_\_\_

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this application and on the Continuation Sheet that are changed to conform with the amount certified.)

### ARCHITECT:

By: \_\_\_\_\_ Date: \_\_\_\_\_

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein, issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$ _____	\$ _____
Total approved this month	\$ _____	\$ _____
TOTAL	\$ _____	\$ _____
NET CHANGES by Change Order	\$ _____	\$ _____



# Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER

ARCHITECT

CONTRACT FOR:

CONTRACTOR

SURETY

OTHER

TO OWNER: *(Name and address)*

CONTRACT DATED:

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

## SUPPORTING DOCUMENTS ATTACHED HERETO:

- 1 Consent of Surety to Final Payment.  
Whenever Surety is involved, Consent of Surety is required. Consent of Surety, may be used for this purpose.

Indicate Attachment  Yes  No

*The following supporting documents should be attached hereto if required by the owner.*

- 1 Contractor's Release or Waiver of Leins, conditional upon receipt of final payment.
- 2 Separate Releases of Waivers of Leins from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.
- 3 Contractor's Affidavit of Release of Leins

CONTRACTOR: *(Name and address)*

BY:

\_\_\_\_\_  
*(Signature of authorized representative)*

\_\_\_\_\_  
*(Printed name and title)*

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

## Contractor's Affidavit of Release of Leins

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER

ARCHITECT

CONTRACT FOR:

CONTRACTOR

SURETY

OTHER

TO OWNER: *(Name and address)*

CONTRACT DATED:

STATE OF:

COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lein attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have leins or encumbrance or the right to assert liens or encumbrances against any property of the Owner arising in any number out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

CONTRACTOR: *(Name and address)*

- 1 Contractor's Release or Waiver of Leins, conditional upon receipt of final payment.
- 2 Separate Releases or Waivers of Leins from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

BY:

\_\_\_\_\_  
*(Signature of authorized representative)*

\_\_\_\_\_  
*(Printed name and title)*

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

## Consent of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER

ARCHITECT

CONTRACT FOR:

CONTRACTOR

SURETY

OTHER

TO OWNER: *(Name and address)*

CONTRACT DATED:

---

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the  
*(Insert name and address of Surety)*

on bond of

*(Insert name and address of Contractor)*

, SURETY,

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that the final payment to the Contractor shall not relieve the Surety of any of its obligations to

*(Insert name and address of Owner)*

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:

*(Insert in writing the month followed by the numeric date and year.)*

\_\_\_\_\_  
*(Surety)*

\_\_\_\_\_  
*(Signature of authorized representative)*

Attest

(Seal):

\_\_\_\_\_  
*(Printed name and title)*

- D. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Include accessories, hardware, gate operation, and operational clearances.
- E. Samples: Submit two samples of fence fabric, slat infill, 8 inch by 10 inch in size illustrating construction and colored finish.
- F. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation anchor bolt templates, and \_\_\_\_\_.
- G. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines \_\_\_\_\_.

#### **1.05 FIELD CONDITIONS**

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

#### **1.06 WARRANTY**

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences, gates and operators that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to comply with performance requirements.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - c. Faulty operation of gate operators and controls.
  - 2. Warranty Period: Five years from date of Substantial Completion.

#### **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7. Design shall account for added wind resistance from privacy slats and windscreen fabrics where these items are shown on the drawings.
  - 1. Design Wind Load: As indicated on Drawings.

2. Minimum Post Size and Maximum Spacing: As indicated on Drawings and as determined according to CLFMI WLG 2445, based on mesh size and pattern specified, except that if drawing details conflict with CLFMI WLG 2445, provide larger posts and closer spacings as detailed.

## 2.02 MANUFACTURERS

- A. Chain Link Fences and Gates:
  1. Master-Halco, Inc: <https://www.masterhalco.com/#sle>.
  2. Builders Fence Company: [www.buildersfence.com](http://www.buildersfence.com)
  3. Merchants Metals: <https://www.merchantsmetals.com/#sle>.
  4. Substitutions: See Section 01 6000 - Product Requirements.

## 2.03 MATERIALS AND COMPONENTS

- A. Materials and Components: Conform to CLFMI Product Manual for structural performance as specified.
- B. Fabric Size: CLFMI Standard Industrial, Heavy Residential service and as specified below.
  1. Top and bottom selvage knuckle ends closed
  2. Chain Link Fabric 2 inch mesh, 6 gauge, 0.148 in. diameter steel wire core, height as shown on Drawings, except if no height is shown, provide 5'-0" height.
  3. Polymer coated steel chain link fabric per ASTM F668, Class 2b Fused and adhered to metallic coated steel wire.
    - a. Color of chain link fabric per ASTM F934, Black.
  4. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
- C. PVC Color Coated Steel Fence Framework.
  1. Framework color to match fabric.
- D. Intermediate Steel Posts: Type I round.
- E. Fittings
  1. All fittings to be PVC thermally fused color coated having a minimum thickness of 0.006" per ASTM F626. PVC color to match fabric and framework. Moveable parts, nuts and bolts to be field coated with PVC liquid touch up after installation.
  2. Post caps: ASTM F626 galvanized pressed steel, malleable iron, or aluminum alloy weather tight closure cap for tubular posts. Provide one cap for each post. "C" shaped line post without top rail do not require post caps. When top rail is specified provide line post loop tops to secure top rail.
  3. Rail ends: Galvanized pressed steel per ASTM F626, for connection of rails to post using a brace band.
  4. Top rail sleeves: 7" galvanized steel sleeve per ASTM F626. [If expansion and contraction of the rail is of concern, add a 0.137" wire diameter by 1.80" long expansion spring between the adjoining rails]
  5. Wire ties: 9 gauge (0.148") galvanized steel wire for attachment of fabric to line posts and rails. Alternate double wrap 13 gauge (0.092") galvanized steel wire for rails and braces. Pre-formed hog ring ties to be 9 gauge (0.148") galvanized steel or aluminum for attachment of fabric to tension wire. Tie wire and hog rings PVC coated and in compliance with ASTM F626. Color to match fabric color.
  6. Brace and tension (stretcher bar) bands: ASTM F626 galvanized 12 gauge (0.105") pressed steel by 3/4" formed to a minimum 300 degree profile curvature for post attachment. Secure bands using minimum 5/16" galvanized carriage bolt and nut.



7. Tension (stretcher) galvanized steel bars: One piece lengths equal to 2 inches less than full height of fabric with a minimum cross-section of 3/16" x 3/4" ( per ASTM F626. Provide tension (stretcher) bars where chain link fabric is secured to the terminal post.
8. Truss rod assembly: Galvanized steel minimum 5/16" diameter truss rod with pressed steel tightener, in accordance with ASTM F626
9. Carriage bolts and nuts: Galvanized of commercial quality

F. Tension Wire

1. Tension wire: Poly Vinyl Chloride (PVC) coated metallic coated steel tension wire per ASTM F 1664 7 gauge steel core wire, 0.177" PVC coating class and color to match chain link fabric.

G. Concrete: Type specified in Section 03 3000.

## 2.04 CHAIN LINK SWING GATES

- A. Swing gates, single and double leaf types where indicated, height of gate to equal height of fence.
  1. Gate Width: As shown on Drawings, except if no dimensions are shown then provide single leaf type minimum 48 inches wide and double leaf gates 96 inches wide, (48 inches per leaf).
  2. Fabricate chain link swing gates of welded construction with gate frame members spacing no greater than 8' 0" apart horizontally or vertically, in accordance with ASTM F900. Exterior members to be 1.900 inch OD pipe, interior members shall be 1.660 inch OD pipe. PVC coated pipe to be Grade 1 ASTM F1083.
  3. Chain link fabric to match material of fence. Stretch fabric tightly and secure to vertical outer frame members using tension bar and tension bands spaced 12 inches on center and tied to the horizontal and interior members 12 inches on center using 9 gauge galvanized steel ties.
- B. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.
- C. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.

## 2.05 ACCESSORIES

- A. Privacy Slats: High density virgin polyethylene, stable color pigment with ultraviolet inhibitors, 25 year limited warranty against color fading and breakage of slats and locking-channel used under normal climactic extremes experienced in North America and Hawaii. Color: Black. Standard PDS self- locking using horizontal bottom channel locking system.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install framework, fabric, accessories and gates as indicated and in accordance with ASTM F567.
- B. Place fabric on inside of posts and rails.
- C. Set intermediate and other posts plumb, in concrete footings with top of footing 6 inches below finish grade. Slope top of concrete for water runoff.

- D. Line Post Footing Depth Below Finish Grade: ASTM F567, minimum and deeper as shown on drawings and to resist imposed loads as specified.
- E. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567, minimum and deeper as shown on drawings and to resist imposed loads as specified.
- F. Brace each gate and corner post to adjacent line post with horizontal center brace rail \_\_\_\_\_. Install brace rail one bay from end and gate posts.
- G. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
- H. Provide bottom rail at transformer and mechanical equipment enclosures and athletic backstops.
- I. Install center brace rail on corner gate leaves.
- J. Do not stretch fabric until concrete foundation has cured 2 days.
- K. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- L. Position bottom of fabric 2 inches above finished grade.
- M. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- N. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- O. Install bottom tension wire stretched taut between terminal posts.

### 3.02 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.
- B. Do not attach the hinged side of gate to building wall; provide gate posts.
- C. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.

### 3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.
- C. Do not infringe on adjacent property lines.

### 3.04 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

**END OF SECTION**

## SECTION 01 3200

### CONSTRUCTION PROGRESS SCHEDULE

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Prepare cost loaded Construction schedule using the critical path method (CPM) demonstrating fulfillment of all contract requirements.
- B. Submittals and Distribution.
- C. Review.
- D. Rain days.

##### 1.02 RELATED SECTIONS

- A. Document 00 5200 - Contract: Contract Duration and provisions for liquidated damages.
- B. Section 01 2900 - Applications For Payment: Schedule of values.
- C. Section 01 4000- Quality Control: Inspection and testing reports.

##### 1.03 DEFINITIONS

- A. Critical Path Method (CPM): A method of planning and scheduling a construction project where activities are arranged based on activity relationships and network calculations to determine when activities can be performed and the critical path of the Project.
- B. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall project duration.
- C. Network Diagram: A graphic diagram of a network schedule, showing the activities and activity relationships.
- D. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical activities are activities on the critical path.
  - 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- E. Event: An event is the starting or ending point of an activity.
- F. Milestone: A key or critical point in time for reference or measurement.
- G. Float is the measure of leeway in activity performance.

1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
2. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.
3. Float time shall accrue to the Owner and to the Owner's benefit.

#### **1.04 QUALITY ASSURANCE**

- A. Scheduler: Contractor's personnel or Specialist Consultant to the Contractor specializing in CPM scheduling with three years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within forty-eight (48) hours of request.
- B. Designate, in writing, an authorized representative who will be responsible for the preparation of the CPM schedule and progress of the project. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the Construction Schedule requirements.
- C. Within 5 calendar days from Notice of Award, submit demonstration of competence in use of CPM scheduling, including evidence of the use of CPM scheduling as specified above. In the event of failure to satisfy Architect of competence, the Contractor shall be required to employ a qualified CPM consultant to be approved by the Architect.
  1. The cost of revision to the CPM schedule, not resulting from authorized contract changes, shall be the responsibility of the Contractor.

#### **1.05 SCHEDULE OF INSPECTIONS AND TESTS**

- A. Provide information regarding tasks requiring special inspection and tests to District's inspection and testing laboratory, as requested.

#### **1.06 CONSTRUCTION SCHEDULE**

- A. Prepare the Construction Schedule using the network analysis diagram system known as the critical path method (CPM). Follow procedures outlined in AGC's "Construction Planning & Scheduling".
  1. Proceed with preparation of the network diagram immediately following Notice of Award.
  2. Follow the steps necessary to complete development of the network diagram in sufficient time to submit the CPM Schedule so it can be accepted for use no later than 30 days after commencement of the Work.
  3. Conduct educational workshops to train and inform key project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule.
  4. Establish procedures for monitoring and updating the CPM Schedule and for reporting progress. Use "one working day" as the unit of time.
- B. CPM Schedule Preparation: Prepare a list of all activities involved in the Project. Include a list of activities required to complete the Work. Provide the best data available for generation of the network diagram and the CPM Schedule.
  1. Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities.
  2. Indicate estimated times for the following activities to be performed:
    - a. Preparation and processing of submittals.
    - b. Purchase of materials.

- c. Delivery.
  - d. Fabrication.
  - e. Installation.
  3. Include, in the network diagram, separate activities showing:
    - a. Preparation and submittal of shop drawings.
    - b. Architect review of shop drawings, including review and selection of colors.
    - c. Procurement and delivery of materials and equipment.
    - d. Installation and testing of major equipment.
    - e. Required delivery for all Owner supplied, Contractor installed items.
  4. Include a legend showing:
    - a. Each location or area code number and the place or location it refers to.
    - b. Each responsibility or trade code number and the trade or entity it refers to.
  5. Indicate each building or separate area as a separately scheduled element of the Work.
  6. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
  7. Where the work of several trades is combined into one activity, the Contractor shall furnish, for each such combined activity, the cost breakdown of each trade on sheets separate from the network diagram. The sum of the costs for each trade shall equal the total dollar value of each such combined activity.
- C. Submit the following supporting data with the submittal of the original CPM construction schedule. Any changes to this information shall be submitted with successive updates and revisions.
1. The proposed number of working days per week.
  2. The holidays to be observed during the duration of the contract (by day, month, and year).
  3. The planned number of shifts per day.
  4. The number of hours per shift.
  5. The planned usage of major construction equipment on the site, on a monthly basis.
  6. The average weekly manpower usage for each trade to be employed on the project.
- D. Processing: Enter prepared data on the processing system. Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM Schedule within the limitations of Contract Time.
- E. Format: Display the full network on a single sheet of stable transparency, or other reproducible media, of sufficient width to show data clearly for the entire construction period.
1. Mark the critical path. Locate the critical path near the center of the network; locate paths with the most float near the edges.
  2. Sub networks on separate sheets are permissible for activities clearly off the critical path.
- F. Initial Issue: Prepare the initial issue of the CPM Schedule network diagram from a listing of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports to show the following:
1. The Contractor or subcontractor and Work or activity.
  2. Description of the activity.
  3. Principal events of that activity.
  4. Immediate preceding and succeeding activities.
  5. Early, late and actual start dates.
  6. Early, late and actual finish dates.
  7. Activity duration in working days.

8. Total float and free float time. Float time shall accrue to the Owner and to the Owner's benefit.
  9. Average size of work force.
  10. Monetary value of activity (coordinated with the Schedule of Values).
- G. Value Summaries: Prepare 2 cumulative value listings, sorted by finish dates.
1. In first listing, tabulate the following:
    - a. Activity number.
    - b. Early finish date.
    - c. Dollar value.
    - d. Cumulative dollar value.
  2. In second listing, tabulate the following:
    - a. Activity number.
    - b. Late finish date.
    - c. Dollar value.
    - d. Cumulative value.
  3. In subsequent issues of both listings, substitute actual finish dates for activities completed as of listing date.
- H. Prepare listing for ease of comparison with payment requests: coordinate timing with progress meetings.
1. In both value summary listings, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
  2. Submit value summary printouts following each regularly scheduled progress meeting.
  3. Provide monthly project cash flow analysis upon District's request at no additional cost.

#### 1.07 REVISIONS TO SCHEDULES

- A. Graphically indicate progress of each activity to date of submittal, and projected completion date of each activity as referenced to the baseline date for that activity as shown in the initial schedule.
- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- C. Insert Delay Contingency activities into the critical path at the point where they occur, incorporating the mutually agreed duration per the Article on DELAY CONTINGENCY. Shorten the initial Delay Contingency activity by this mutually agreed duration.
- C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect including the effect of changes on schedules of separate contractors.
- D. Revision to the CPM schedule may require reallocation of costs. Revised activity cost data shall be submitted with revised CPM schedules as necessary.
- E. After each monthly update or revision, the Contractor shall submit, to the Architect, one complete set of reproducible transparencies of the last accepted CPM schedule, each marked up in red, showing all revisions and changes in accordance with the monthly review meeting.
- F. Within five (5) working days after receipt of notice from the Architect, the Contractor shall submit a revised CPM schedule for any of the following reasons:

1. When delay in completion of any activity, or group of activities, indicates an overrun of the contract time or milestone requirement by 20 working days or ten percent (10%) of the remaining duration, whichever is less.
2. Delays in submittals or deliveries or work stoppage are encountered which make re-planning or rescheduling of the work necessary.
3. The schedule does not represent the actual prosecution and progress of the project as being performed in the field.

#### **1.08 SUBMITTALS**

- A. Submit initial schedules within fifteen (15) calendar days after date of Owner-Contractor Agreement. After review, resubmit required revised data within five days.
- B. Submit revised Progress Schedules with each Application for Payment. Submittal of revised Progress Schedule is a condition precedent to receipt of Payment.
- C. Submit the number of opaque reproductions which Contractor requires, plus three copies which will be retained by Architect. In addition, submit each schedule submittal, including initial submittal, in the Scheduling software's complete and original software file format on Compact Disc - Read Only (CD-ROM). Provide one such disk with each schedule submittal. Architect will retain CD-ROM electronic versions.
- D. Submit "three-week look ahead" report in bar-chart format indicating activities scheduled to occur in the up-coming two week period. Provide and discuss these submittals at the progress meetings specified in Section 01 3900 and additionally as requested by the Architect, Owner or Inspector.

#### **1.09 PROGRESS REPORTING, UPDATING AND REVISIONS:**

- A. On a date mutually agreed upon by the Architect and the Contractor, a job site progress meeting will be held each month at which time the CPM schedule will be reviewed and updated. Attendees of this meeting shall include the Architect, the General Contractor and subcontractors, if requested by the Architect. The Contractor shall have its copy of the Payment Request form and all other data required by the Contract Documents accurately filled in and completed prior to this meeting. Job Progress and the CPM schedule will be reviewed to verify:
  1. Payment due to the Contractor, based on percentage complete of items in the submitted Payment Request form.
  2. Logic, time and cost data for change order work that is to be incorporated into the CPM schedule or Payment Request form.
  3. Status of as-built record drawings and as-built record specifications.
- B. The Contractor shall submit a narrative report as a part of its monthly progress review and update.

#### **1.10 REVIEW**

- A. Architect's review is limited to verification of compliance with the Contract start and end dates and inclusion of Contract Time adjustments.

- B. To the extent that the CPM schedule or any revised CPM schedule shows anything not jointly agreed upon, it shall be deemed to have not been accepted by the Architect. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase notwithstanding the Architect's acceptance of the CPM schedule.
- C. Acceptance of any revised CPM schedule and all supporting data is contingent upon compliance with all other paragraphs of this section and any other previous agreements or requirements with or by the Architect.

#### **1.11 DELAY CONTINGENCY**

- A. Each Contractor submitting a bid proposal shall make allowance in its proposal and Project Schedule for sixty (60) work days for delay to the critical path due to inclement weather or delay due to circumstances beyond the Contractor's control.
- B. Extension of time for delay due to inclement weather or circumstances beyond the Contractor's control will be allowed only in the event that the total number of critical path work days delayed exceeds the number of days allowed in paragraph A of this Article. No time extension will be allowed for delays that do not affect the critical path as set forth in the master schedule.
- C. No time extension will be allowed for inclement weather occurring on any Saturday, Sunday, National or other holiday, including holidays recognized by specific unions, crafts or trades. Exception: If any day defined above is scheduled as a work day under the provisions of the Article CONTRACTOR'S RESPONSIBILITY FOR COMPLETION and approved by the Architect and Owner, or as otherwise approved by the Owner.
- D. A rain day is defined as any day that receives .130" or greater rainfall as reported by a local weather service acceptable to the Architect and is cause for work to be stopped. For the purposes of this project, Rain Days must meet this definition and be mutually approved and agreed upon on the day that a rain day occurs by the Contractor and the Architect. Contractor will post and maintain, in a conspicuous location, a calendar of so-approved rain days at the Contractor's jobsite trailer.

#### **1.12 CONTRACTOR'S RESPONSIBILITY FOR COMPLETION:**

- A. The Contractor agrees that whenever it becomes apparent from the monthly progress review meeting or the schedule that contract completion dates will not be met, it shall take some or all of the following action at no additional cost to the Owner:
  - 1. Increase construction manpower in such quantities and crafts as will bring the progress of the work into conformance with all other requirements of this section.
  - 2. Increase the number of working hours per shift, shifts per working day, workdays per week, the amount of construction equipment or any combination of the foregoing, to bring the scheduling and progress of the work into conformance with all requirements of the Contract Documents.
  - 3. Reschedule the work under this contract in conformance with all other contract requirements to demonstrate completion of the contract work within the contract time.
- B. Compensate owner for costs incurred to the Owner for rescheduling or additional testing, inspection, or architectural services made necessary by the Contractor's actions.



### **1.13 ADJUSTMENT OF THE CONTRACT TIME:**

- A. The contract time will be adjusted only for causes specified in the Contract Documents. In the event the Contractor requests an adjustment of the contract time, it shall furnish such justification, CPM data and supporting evidence as the Architect may deem necessary for a determination as to whether or not the Contractor is entitled to an adjustment of time under the provisions of the contract. Submission of proof based on revised activity logic, duration and cost is obligatory with any request. Requests not conforming to these requirements are deemed to be waived.
- B. The Contract Time will be not be adjusted for any reason, including weather, until the latest accepted schedule clearly displays that the Contractor has used, in full, all the float time available for the Work. Delays in activities which, according to the latest accepted schedule, are not on the critical path in the CPM schedule will not be the basis for an adjustment to the contract time.
- C. The Contractor shall submit each request for an adjustment in the contract time to the Architect in accordance with all other requirements of the Contract Documents. The Contractor shall include, as part of each request:
  - 1. Justification for the delay in narrative form.
  - 2. A sub network showing all CPM logic revisions, duration changes and cost changes for the work in question and its relationship to other activities on the CPM schedule.
- D. The Architect's determination as to the adjustment of the contract time shall be based upon the latest schedule which has been accepted at the time of the alleged delay and all other relevant information. The Contractor shall submit with every request, an updated CPM schedule whenever the actual field progress of the work does not conform to the accepted schedule in force at the time of the alleged delay. The CPM data, if accepted by the Architect, shall be included in the next monthly updating of the schedule.
- E. The Architect shall, within a reasonable time after receipt of a request and supporting evidence for extension of the contract time, review the facts and shall advise the Contractor, in writing, of its decision.

### **1.14 DISTRIBUTION**

- A. Distribute copies of reviewed schedules to Project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- C. Architect will distribute copies to the Owner and the Inspector.

## **PART 2 PRODUCTS**

### **2.01 SCHEDULING SYSTEMS**

- A. Prepare schedules using professional quality scheduling software systems designed for this purpose, capable of producing results specified.
- B. Acceptable products:

1. Primavera Systems
2. Microsoft Project

**PART 3          EXECUTION**

**END OF SECTION**

## SECTION 01 3300

### SUBMITTALS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Submittals required by the Contract Documents. Revise and re-submit as necessary to establish compliance with Contract Documents.
  - 1. It is reasonable that the Contractor will provide a satisfactory submittal by the second submittal. If repeated resubmittals are required, the Owner may "back charge" the Contractor for the cost of review and processing.

##### 1.02 WORK NOT INCLUDED

- A. Submittals which are not required will not be reviewed by the Architect.
- B. The Contractor may require subcontractors to provide drawings, setting diagrams or similar information as part of the coordination of the Work. The Architect will not review this data.

##### 1.03 RELATED WORK

- A. Section 01 3100 - Construction Schedules: Dates for submission and dates that reviewed submittals will be required shall be designated in the Construction Schedule.
- B. Section 01 7000 - Contract Closeout: Project record documents.

##### 1.04 QUALITY ASSURANCE

- A. Submit to the Architect for review, product literature, samples and shop drawings as specified or required to fully describe every item proposed for incorporation in the work. Only approved items may be used.
- B. Prior to submittal, review and coordinate all aspects of each item. Verify that each item and it's submittals conform to Contract Document requirements. Contractor assumes full responsibility for coordinating and verifying information, quantities and dimensions shown in submittals.
- C. Submittals shall include:
  - 1. Date and revision dates.
  - 2. Project title and number.
  - 3. The names of:
    - a. Architect/Engineer.
    - b. Contractor.
    - c. Subcontractor.
    - d. Supplier.
    - e. Manufacturer.
    - f. Separate detailer when pertinent.
  - 4. Identification of product or material.

5. Relation to adjacent structure or materials.
  6. Field dimensions, clearly identified as such.
  7. Specification section number.
  8. Applicable standards, such as ASTM number or Federal Specification.
  9. A blank space, 8 inches x 3 inches, for the Contractor and Architect stamps.
  10. Identification of deviations from Contract Documents.
  11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.
  12. Signature of and calculations by an engineer, licensed in California, where required by specifications.
- D. Indicate review and approval of each submittal prior to transmittal to Architect by affixing Contractor's stamp, initialed or signed, certifying:
1. Review of submittal
  2. Verification of compliance with requirements of the Contract Documents.
  3. Verification of compatibility with other submittals, shop drawings, substitutions, and work of other trades.
  4. Coordination with existing job conditions and field construction criteria.
  5. Field verification of dimensions.
- E. Architect will review Contractor's stamp language. Revise language in accordance with Architect's comments and provide new stamp if required by Architect.
- F. Architect will return unreviewed any submittal not stamped by the Contractor in accordance with the above.
- G. Direct Architect's attention to any deviations from the Contract Documents . Deviations not so noted shall be considered unreviewed.
- H. Direct Architect's attention to any changes made in submittals other than those specifically requested by Architect. Changes not so noted shall be considered unreviewed.
- I. Work shall not be fabricated, nor material shipped to project site prior to the distribution of approved submittals from the Architect.

#### **1.05 SUBMITTALS**

- A. Make submittals of shop drawings, product data, samples, substitution requests, meeting minutes and other items required by the Contract Documents in accordance with the provisions of this Section.
- B. Submittals shall include all technical and performance data necessary for the Architect to properly evaluate the submittal. Provide physical samples if requested by Architect, whether expressly specified or not.
- C. Incomplete submittals will be return to the Contractor without review. Contractor shall be responsible for delays incurred by incomplete, multiple reviews or rejected submittals.
- D. Provide only one make or brand of any product proposed.

## **PART 2 PRODUCTS**

### **2.01 SHOP DRAWINGS**

- A. Shop drawings are to be drawn at large scale, fully detailed and with all materials and stock or purchased components fully identified. Shop drawings are to be submitted when specified and to illustrate every custom fabricated item or assembly.
- B. Types of prints required: See 3.01 ELECTRONIC SUBMITTAL PROCEDURES.
- C. Drawings are to be identified showing the project name, the Owner's name and account number, the Architect's name and job number, the Contractor's name and the specification section number and drawing detail reference number relating to the work shown.

### **2.02 PRODUCT DATA**

- A. Submit detailed technical literature fully describing every product or item proposed for use including manufacturers and items specified. Include manufacturer's detailed specifications, drawings, photographs, performance criteria, installation instructions, test data, samples of colors and finishes and other information required to fully describe the item.
  - 1. Modify standard product data to delete information which is not pertinent.
  - 2. Provide additional information which is specifically applicable.
- B. Mark all submittals indicating items, options, and finishes proposed, and referencing project specification section and paragraph covering the work in question. Indicate as follows:
  - 1. Performance characteristics and capacities.
  - 2. Dimensions and/or clearances required.
  - 3. Wiring, piping and control diagrams.

### **2.03 SAMPLES**

- A. Samples shall be identical to the precise article proposed, illustrating functional characteristics with all related parts and attachments. Indicate full range of color, textures and patterns.
- B. Samples shall be identified by attaching a label on unexposed side of Samples that include the following:
  - 1. Generic Description of Sample.
  - 2. Product name and name of manufacturer.
  - 3. Number and title of applicable Specification Section.
- C. Submit number of samples as indicated above. Where samples of large complete items such as light fixtures, hardware, etc. are required, one sample will suffice and that will be returned to the Contractor after review.

### **2.04 COLORS AND PATTERNS**

- A. Submit color and pattern selections for all products offering a choice of these attributes unless a specific color or pattern is referenced in the Contract Documents.

- B. Submit within thirty five (35) days of Notice of Award a list of all required color selections organized by product, including manufacturer and model. Include samples of manufacturer's complete color range for all products.
- C. Architect will not select colors or patterns until samples of all items requiring selections have been submitted. Architect will not make partial color selections.
- D. Failure to submit all color selections as specified above, thus requiring additional unanticipated time for the Architect to make selections will not be basis for extension of Contract Time.
- E. Architect will make color selections within 30 working days following complete submittal of samples. This time will commence with the receipt of the latest incremental submittal, as applicable.
- F. Architect will issue Color Schedule.

### **PART 3 EXECUTION**

#### **3.01 ELECTRONIC SUBMITTAL PROCEDURES**

- A. Submittals shall be transmitted to the Architect in electronic, editable (PDF) format using the project's cloud-based file sharing and storage service ("project's website"). The cloud-based file sharing and storage service will be selected by the Architect. Contractor's failure to utilize, provide entries and processing through the Architect's cloud-based system will subject Contractor to hourly back charges associated with efforts required by others to perform work which is the contractual responsibility of the Contractor.
- B. Contractor's cost related to the use of the project's website services shall be included in the Contractor's bid.
- C. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
- D. For the shop drawings larger than 11' x 17' size and Deferred Approvals, submit (3) hardcopies to the Architect and also submit electronically on the project's website. Provide additional hardcopies, as requested by Architect.
- E. Provide hardcopy submittals if requested by Architect.
- F. The Architect's review comments will be made available on the project's website for downloading.
- G. Contractor will distribute a hardcopy of all reviewed submittals to the Inspector of Record, Owner, and Construction Manager.

#### **3.02 ADMINISTRATION REQUIREMENTS**

- A. Name electronic file using the following identifiers, separated by dashes: consecutive submittal number, specification section number, revision number (if needed), and a brief description of the submittal contents; example: 015-05 5000-0 Metal Fabrications.
- B. Write sequential page numbers at bottom of each page of submittal. On submittal cover sheet, provide brief description for product and coinciding page numbers; example: Pages 5-23 Metal Fabricated Gate Shop Drawings.
- C. Provide the following on the submittal cover sheet:
  1. Project title and project number.
  2. Date.
  3. Submittal number.
  4. The name of:
    - a. Architect/Engineer.
    - b. Contractor.
    - c. Subcontractor.
    - d. Supplier.
    - e. Manufacturer.
    - f. Separate detailer when pertinent.
  5. Identification of product or material and page numbers.
  6. Submittal number, as described in 3.03.
  7. A blank space, 8 inches x 3 inches, for the contractor and Architects stamps.
  8. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, and compliance with Contract Documents.
- D. Unless otherwise indicated in technical specifications, not less than 15 days following Notice of Award, submit a complete submittal register utilizing spreadsheet provided by Architect. The architect provided submittal register is a template including most potential submittal items. Contractor shall strike through any submittal items not intended for submittal and highlight any revisions or additions to the template provided. All columns of information shall be filled out in full. Contractor shall then return edited spreadsheet to Architect for review. Spreadsheet format must not be altered to allow insertion into project data base. Once reviews are complete, the Architect will upload the submittal register into the project data base for all party's utilization.

### **3.03 IDENTIFICATION OF SUBMITTALS**

- A. Number submittals consecutively. Each specification section requiring submittal must at a minimum have one unique submittal number. **DO NOT GROUP MULTIPLE SPECIFICATION SECTION ITEMS UNDER ONE SUBMITTAL NUMBER.** Refer to submittal by this number in subsequent correspondence and submittals.
  1. Transmit re-submittals under new cover. Use submittal number of original submittal with revision number suffix. Cite original submittal number for reference.
  2. Do not transmit new submittals with alphabetic suffix.

- B. Transmittal letter for each submittal shall show all information required for identification and checking.
- C. Include submittal number on first page and elsewhere as required for identification.
- D. Maintain log of submittals and status. Furnish copies to the Architect and Inspector upon request.

### **3.04 GROUPING OF SUBMITTALS**

- A. Transmit submittals in groups containing all associated items to ensure availability of information during review. However, each specification section must bear unique submittal number.
- B. Incomplete or partial submittals may be returned for enhancement. No extension of time will be allowed for delays related to incomplete submittals.

### **3.05 SCHEDULING OF SUBMITTALS**

- A. Transmit submittals sufficiently in advance of installation for required review, revisions, re-submittals and delivery. Include time required for transmittal by regular mail between the parties involved. No extension of time will be allowed for delays related to late submittals.
- B. Deferred approval submittals are subject to long lead times. Schedule submittals accordingly.

### **3.06 ARCHITECT'S REVIEW OF SUBMITTALS**

- A. Submittals will be reviewed and stamped by the Architect "No exceptions taken," "Submit specified item" or "Make corrections noted" to indicate full or conditioned approval or "Revise and resubmit" or "Rejected" to indicate disapproval. Terms are defined as follows:
  - 1. No Exceptions Taken: Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown in the partial submittal.
  - 2. Submit specified item: Submit to the Architect the items indicated for review.
  - 3. Correct as noted: Same as 1., except that minor corrections as noted shall be made by the Contractor. No resubmittal required.
  - 4. Revise and resubmit: Rejected because of major inconsistencies or errors which shall be resolved or corrected by the Contractor prior to subsequent review by the Architect.
  - 5. Rejected: Submitted material does not conform to plans and specifications in major respect. For example, wrong size, model, capacity or material. Resubmit.
  - 6. Receipt Acknowledged. Received, recorded and distributed without further action.
- B. Submittals reviewed by the Architect which have been stamped shall be deemed to have the following language affixed and made a part thereof, regardless of the initial or subsequent readability of the actual stamp.



1. Corrections or comments made on submittals during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. This check is for review of general conformance with the design concept of the project and general compliance with information given in the Contract Documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selection of fabrication processes and techniques of construction, coordinating the work of the trades; and performing the work in a safe and satisfactory manner.
- C. Architect's review of submittals shall be undertaken with reasonable promptness, while allowing sufficient time in the Architect's professional judgment to permit adequate review.
- E. Architect's review of submittals has, as a primary objective, to assist in the completion of the project on time and in conformance with the Contract requirements by permitting review of material and fabricated items prior to ordering. Architect's review of submittals is based only on the data presented and extends only to conformance with general design intent and information contained in the Contract Documents.
- E. Architect's approval of submittals does not constitute final acceptance or unqualified approval of items or work proposed or put in place, nor does it constitute acceptance of responsibility for the accuracy, coordination or completeness of submittals. Architect's approval of submittals does not relieve the Contractor from the responsibility for errors, omissions, or compliance with all the requirements of the Contract Documents.
- F. Reimbursement of the Architect's costs for review:
  1. Architect will record all time and expenses incurred to review submittals requiring more than two reviews.
  2. Contractor shall reimburse the District through deduction from amounts due the Contractor upon receipt of the Architect's billing and that of the Architect's consultants at standard billing rates for all time and expenses incurred in unanticipated reviews.
- G. Architect's review of submittals does not change the Contract in any manner.

### **3.07 RESUBMITTAL**

- A. Make all corrections or revisions required by reviewer's comments at Contractor's expense and resubmit as initially specified above. No additional costs will be authorized for corrections or revisions.
- B. Product data and shop drawings:
  1. Revise initial drawings or data and resubmit as initially specified.
  2. Indicate changes which have been made other than those requested by reviewer.
- C. Submit new samples as initially specified.

### **3.08 DEFERRED APPROVAL**

- A. Items so designated in the Contract Documents are subject to deferred approval review by the Division of the State Architect (DSA).

- B. Not less than 15 days following Notice of Award, submit all items specified for deferred approval complete with all structural calculations, test data and information as specified or as subsequently required by the reviewing agency, including original engineering stamps and original signatures as required. Architect shall submit to DSA only following Architect/Engineer review.
  - 1. Note that DSA review will be provided through Bluebeam Studio (PDF platform that allows active commenting and collaboration) sessions. Contractor will be required to participate in Bluebeam Studio sessions and therefore will be required to obtain appropriate software license.
  - 2. The Architect will not approve deferred approval submittals until they are approved by DSA.
- C. No work or fabrication shall begin until DSA approved submittals are distributed to the Contractor.
- D. Contractor is notified that significant lead time is required for deferred approval review by DSA and shall schedule work accordingly. No extension of Contract Time will be allowed for delays incurred by deferred approval review.
  - 1. The Architect is not responsible for DSA delays in deferred approval review.

### **3.09 DISTRIBUTION**

- A. Distribute only submittals with Architect/Engineer (and DSA as applicable) stamps of review. Contractor is responsible for coordination of submittals and comments following review. Contractor to provide all additional reproduction costs for copies required by the Contractor at its expense. No additional costs will be authorized for Contractor costs pertaining to submittals.

**END OF SECTION**

## SECTION 01 3546

### CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN

#### PART 1 - GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections, apply to this section.

##### 1.02 SECTION INCLUDES

- A. Description of a construction Indoor Air Quality (IAQ) Management Plan.
- B. IAQ construction requirements.

##### 1.03 RELATED SECTIONS

- A. Section 01 6116 - VOC Restrictions.
- B. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC: Additional requirements for baseline testing for IAQ.
- C. Section 23 0593- Testing, Adjusting, and Balancing for HVAC: Cleaning of HVAC system including ductwork, air intakes and returns, and changing of filters.

##### 1.04 REFERENCES

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE):
  - 1. ASHRAE Standard 52.1-1992, Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices in General Ventilation for Removing Particulate Matter.
- B. ASTM International (ASTM):
  - 1. ASTM D5116-97, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
- C. Sheet Metal and Air Conditioning National Contractors Association (SMACNA):
  - 1. IAQ Guidelines for Occupied Buildings under Construction, 1995.

##### 1.05 INDOOR AIR QUALITY

- A. Goals: The Owner has set the following indoor air quality goals for jobsite operations on the project, within the limits of the construction schedule, Contract Sum, and available materials, equipment, products and services. Goals include:
  - 1. Protect workers on the site from undue health risks during construction.
  - 2. Prevent residual problems with indoor air quality in the completed building.

##### 1.06 SUBMITTALS

- A. Indoor Air Quality Plan: Within 14 days after receipt of Notice to Proceed and prior to any waste removal from the project, develop and submit for review a healthy indoor air quality plan. The plan shall include:
  - 1. List of IAQ protective measures to be instituted on the site.
  - 2. Schedule for inspection and maintenance of IAQ measures.

#### **1.07 QUALITY ASSURANCE**

- A. Perform material tests and report results in accordance with ASTM D5116.

### **PART 2 - PRODUCTS**

#### **2.01 SUBSTITUTIONS**

- A. Should the Contractor desire to use procedures, materials, equipment, or products that are not specified but meet the intent of the specifications to protect indoor air quality on the site, the Contractor shall propose these substitutions in accordance with Section 01 6000.

#### **2.02 MATERIALS**

- A. Low emitting products have been specified in appropriate sections.

### **PART 3 - EXECUTION**

#### **3.01 CONSTRUCTION IAQ MANAGEMENT PLAN**

- A. Meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) "IAQ Guidelines for Occupied Buildings Under Construction."
  - 1. Protect the ventilation system components from contamination, OR provide cleaning of the ventilation components exposed to contamination during construction prior to occupancy.
  - 2. Provide a continuous ventilation rate of one (1) air change per hour minimum during construction, OR, conduct a building flush-out with new filtration media at 100 percent outside air after construction ends (following issuance of a Certificate of Occupancy) and prior to occupancy for seven (7) days. Provide a minimum of 85 percent filtration (as determined by ASHRAE Standard 52.1 on any return air systems that are operational during construction, and replace filtration media prior to occupancy.
- B. During installation of carpet, paints, furnishings, and other VOC-emitting products, provide supplemental (spot) ventilation for at least 72 hours after work is completed. Preferred HVAC system operation uses supply air fans and ducts only; exhaust provided through windows. Use exhaust fans to pull exhaust air from deep interior locations. Stair towers and other paths to exterior can be useful during this process.
- C. Conduct regular inspection and maintenance of indoor air quality measures including ventilation system protection, and ventilation rate.
- D. Require VOC-safe masks for workers installing VOC-emitting products (interior and exterior) defined as products that emit 150 gpl or more UNLESS local jurisdiction's requirements are stricter, in which case the strictest requirements shall be followed for use of VOC-safe masks.

- E. Use low-toxic cleaning supplies for surfaces, equipment, and worker's personal use. Options include several soybean-based solvents and cleaning options (SOYsolv) and citrus-based cleaners.
- F. Use wet sanding for gypsum board assemblies. Exception: Dry sanding allowed subject to Architect's approval of the following measures:
  - 1. Full isolation of space undergoing finishing.
  - 2. Plastic protection sheeting is installed to provide air sealing during sanding.
  - 3. Closure of all air system devices and ductwork.
  - 4. Sequencing of construction precludes the possibility of contamination of other spaces with gypsum dust.
  - 5. Worker protection is provided.
- G. Use safety meetings, signage, and [sub] contractor agreements to communicate the goals of the construction indoor air quality plan.

END OF SECTION

## SECTION 01 3900

### COORDINATION AND MEETINGS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Related work.
- C. Discrepancies.
- D. Examination.
- E. Pre-Contract meeting.
- F. Pre-construction meeting.
- G. Site mobilization meeting.
- H. Progress meetings.
- I. Pre-installation meetings.
- J. Project coordination meetings.

##### 1.02 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of the various portions of the Contract Documents to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Coordinate hours and days of Work with local ordinances and requirements.
- C. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

- F. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
- H. Contractor shall coordinate Work with work to be performed by separate contractors as listed in Section 01 1100 - Summary of Work.

### **1.03 RELATED WORK**

- A. Referencing specification sections in "Related Work" articles is for convenience only and shall not be construed as to limit the coordination of the Contract Documents to referenced sections.
- B. Documents affecting the work of any section include, but are not limited to, General Conditions, Supplementary General Conditions, and Sections in Division 01 of these Specifications.
- C. Work in any section may relate to other work in these documents. The Contractor is responsible to coordinate all work.

### **1.04 DISCREPANCIES**

- A. In the event of discrepancy in the Contract Documents or if uncovered conditions are not as anticipated, immediately notify the Architect and secure needed direction.
- B. Do not proceed in areas of discrepancy until such discrepancies have been fully resolved.
- C. Before starting work, verify governing dimensions at the premises, and examine adjoining work on which this work is dependent. No "Extra" or additional compensation will be allowed on account of differences between actual measurements and dimensions shown. Submit differences discovered during the work to Architect for interpretation before proceeding with the associated work.
- D. Any time extension or any increase or decrease of cost resulting from such changes will be adjusted in the manner provided in the General Conditions.

### **1.05 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Examine and verify specific conditions described in individual specification sections.
- C. Verify that utility services are available, of the correct characteristics, and in the correct location.

### **1.06 PRE CONTRACT MEETING**

- A. Architect will schedule a meeting with District and apparent low bidder prior to award of Contract.

- B. Attendance Required: Owner, Architect, and Contractor.
- C. Agenda: Execution of the Notice of Award, Review of documents required for Preconstruction Meeting.

#### **1.07 PRECONSTRUCTION MEETING**

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required: Owner, Architect and Contractor.
- C. Agenda:
  - 1. Execution of Owner-Contractor Agreement.
  - 2. Submission of executed bonds and insurance certificates.
  - 3. Distribution of Contract Documents.
  - 4. Submission of schedule of values.
  - 5. Designation of personnel representing the parties in Contract, and the Architect/Engineer.
  - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
  - 7. Scheduling.
  - 8. Scheduling activities of DSA Inspector of Record.
- D. Architect will record minutes and distribute copies within five days after meeting to participants, and those affected by decisions made.

#### **1.08 SITE MOBILIZATION MEETING**

- A. Architect will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required: Owner, Architect, Special Consultants, Contractor, Contractor's Superintendent and major Subcontractors.
- C. Agenda:
  - 1. Use of premises by Owner and Contractor.
  - 2. Owner's requirements and partial occupancy.
  - 3. Construction facilities and controls provided by Owner.
  - 4. Temporary utilities provided by Owner.
  - 5. Security and housekeeping procedures.
  - 6. Schedules.
  - 7. Application for payment procedures.
  - 8. Procedures for testing.
  - 9. Procedures for maintaining record documents.
  - 10. Requirements for start-up of equipment.
  - 11. Inspection and acceptance of equipment put into service during construction period.
- D. Architect will record minutes and distribute copies within five days after meeting to participants, and those affected by decisions made



### **1.09 PROGRESS MEETINGS**

- A. Schedule and administer meetings throughout progress of the Work at bi-weekly intervals. Provide and discuss “three-week look ahead” schedule reports at these progress meetings. Coordinate progress payments and revised schedule, to monthly meeting attended by an officer of the construction company.
- B. Make arrangements for meetings, prepare agenda with copies for participants and preside at meetings.
- C. Attendance Required: Job Superintendent, major Subcontractors and suppliers, Owner, Inspector of Record and Architect as appropriate to agenda topics for each meeting.
- D. Architect will record minutes and distribute copies within five days after meeting to participants, including Owner, Contractor, and those affected by decisions made.

### **1.10 PREINSTALLATION MEETING**

- A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  - 1. Review conditions of installation, preparation and installation procedures.
  - 2. Review coordination with related work.
- E. Architect will record minutes and distribute copies within five days after meeting to participants, with copies to Owner, Contractor and participants.

### **1.11 PROJECT COORDINATION MEETINGS**

- A. Contractor will schedule project coordination meetings to be held weekly.
- B. Attendance Required: Contractor, job superintendent, Subcontractors, as required.
- C. Contractor will prepare agenda and preside at meeting.
- D. Contractor will record minutes and distribute copies within five days after meeting to participants, Architect and those affected by decisions made.
- E. Copies of the minutes to Architect are required as part of submission of Application for Payment.

### **PART 2 PRODUCTS**

Not Used.

### **PART 3 EXECUTION**

Not Used.

**END OF SECTION**

**SECTION 01 4000**

**QUALITY CONTROL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Quality assurance - control of installation.
- B. Tolerances.
- C. References.
- D. Mockup.
- E. Inspecting and testing laboratories services.
- F. Manufacturers' field services and reports.
- G. Field engineering and staking.

**1.02 RELATED SECTIONS**

- A. Section 01 4200- Reference Standards.
- B. Section 01 3300 - Submittals: Submission of manufacturers' instructions and certificates.
- B. Section 01 4523 - Testing and Inspection Services.
- C. Section 09 0512 - Concrete Floor Moisture Content & pH Testing.
- E. Section 01 6000 - Material, Equipment and Substitutions: Requirements for material and product quality.
- F. Section 01 7000 - Contract Closeout.

**1.03 QUALITY ASSURANCE - CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Correct conditions or workmanship not in conformance with specified standards or quality.
- C. Comply with manufacturers' instructions, including each step in sequence.
- D. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

- E. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- F. Perform Work by persons qualified to produce required and specified quality.
- G. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

#### **1.04 TOLERANCES**

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

#### **1.05 REFERENCES**

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationships, duties, and responsibilities of the parties in Contract or those of the Architect/Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### **1.06 MOCK-UP**

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups are representative of the quality required for the Work.
- D. Where mock-up has been accepted by Architect/Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

**1.07 TESTING AND INSPECTION AGENCY SERVICES**

- A. Owner will appoint, employ, and pay for specified services of an independent Testing and Inspection Agency to perform inspecting and testing. Inspections and Testing will be performed in accordance with Section 01 4523 - Testing and Inspection Services; and the General Conditions.

**1.08 MANUFACTURERS' FIELD SERVICES**

- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship and to initiate instructions when necessary.

**1.09 FIELD ENGINEERING AND STAKING**

- A. Each Contractor awarded Work for this Project shall provide all necessary surveying, layout, lines and grades required for the proper location of the Work.
- B. Contractor agrees to provide any and all false-work, templates, batter-boards and other such structures or devices necessary to provide for the Contractor's layout, lines and grades. Work installed in an incorrect location or elevation shall be removed and re-installed at the expense of the Contractor.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## SECTION 01 4200

### REFERENCE STANDARDS

#### PART 1 GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to work of this section.

##### 1.02 DESCRIPTION OF REQUIREMENTS

- A. General: This section specifies procedural and administrative requirements for compliance with governing regulations and the codes and standards imposed upon the work. These requirements include the obtaining of permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes, and standards.
  - 1. "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.
- B. Governing Regulations: Refer to General and Supplementary Conditions for requirements related to compliance with governing regulations.

##### 1.03 DEFINITIONS

- A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings. (Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon.) Certain terms used in contract documents are defined in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to the extent they are not stated more explicitly in another element of contract documents.
- B. General Requirements: The provisions or requirements of Division 01 sections apply to entire work of Contract and, where so indicated, to other elements which are included in project.
- C. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

- D. Directed, Requested, Etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Architect/Engineer," "requested by "Architect/Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend the Architect's/Engineer's responsibility into the Contractor's area of construction supervision.
- E. Approve: Where used in conjunction with Architect's/Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Architect's/Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.
- F. Project Site: The term "project site" is defined as the space available to Contractor for performance of the work. The extent of project site is shown on the drawings, and may or may not be identical with the description of land upon which the project is to be built.
- G. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- H. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
- I. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- J. Installer: The term "installer" is defined as the entity (person or firm) engaged by Contractor, or its subcontractor or subcontractor for performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.
- K. Testing Laboratory: The term "testing laboratory" is defined as an independent entity engaged to perform specific inspections or tests of the work, either at project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.
- L. Products: The term "products" includes materials, systems and equipment.
- M. Approved Equal, Or Equal: means as approved and accepted by the Architect.
- N. Shall: The term "shall" is mandatory.
- O. As Required, As Necessary, etc.: Words of similar import mean as required by the Contract Documents or essential to the completion of the Work.
- P. Concealed: The term "concealed" means as embedded in masonry or other construction, installed within furred spaces, within double partitions or above suspended ceilings, in trenches, in crawl spaces, or in enclosures.

- Q. Exposed: The term "exposed" means not installed underground or "concealed" as defined above, including work and surfaces open in whole or in part to the exterior or weather.
- R. Work: The term "work" shall include both labor and materials.
- S. The Contract Documents:  
The Contract Documents consist of the Contract, any addenda thereto, the completed Bid Form, the completed Bond and Insurance forms, the Notice Inviting Bids, the Instructions to Bidders, the General Conditions, the Supplementary General Conditions, the Labor Compliance Program, if any, the Technical Specifications, the Drawings and the Bidder's Questionnaire. All modification(s) amending or extending the work shall be as binding as if originally included in the Contract Documents. A Modification is a written amendment to the Contract signed by both parties, a Change Order, a Construction Change Directive, or a written order for a minor change in the Work issued by the Architect. The Contract Documents are complementary, and each obligation of the Contractor, Subcontractors, material or equipment suppliers in any one shall be binding as if specified in all.
- T. The Contract:  
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a written Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Architect and Contractor, between the Owner and any Subcontractor or Sub-subcontractor, or between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.
- U. The Work:  
The Work 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 on 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 or Subcontractor shall also thoroughly examine and become familiar with the Drawings, Specifications, and associated bid documents. The "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.
- V. The Project:  
The Project is the total construction of the Work performed in accordance with the Contract Documents in whole or in part and which may include construction by the Owner or by separate Contractors.
- W. The Drawings:  
The Drawings 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.

X. The Specifications:

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

Y. The Project Manual:

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

#### 1.04 FORMAT AND SPECIFICATION EXPLANATIONS

A. Format Explanation: The format of principal portions of these specifications can be described as in the following paragraphs. Although some portions of these specifications may not be in complete compliance with this format, no particular significance will be attached to such compliance or non-compliance.

1. Sections and Divisions: For convenience, the basic unit of text is a "section." Each section is identified by a descriptive title (name) and the number. Individual sections are grouped together with other sections of similar or related work groupings known as "divisions." Divisions are recognized as the present industry consensus on uniform specification organization and sequence. The section title is not intended to limit meaning or content of a section, nor to be fully descriptive of the requirements specified therein, nor to be an integral part of the text.

a. Each section of specifications has been subdivided into 3 "parts" for uniformity and convenience (Part 1-General, Part 2-Products, and Part 3 - Execution); some sections may not require the use of all three parts. These parts do not limit the meaning of and are not an integral part of text which specifies requirements.

B. Subordination of Text: Portions of specification text are subordinated to other portions in the following manner (lowest level to highest):

1. Indented (from left margin) paragraphs and lines of text are subordinate to preceding text which is not indented, or which is indented by a lesser amount.
2. Paragraphs and lines of text are subordinate to sub-article titles, which are printed in upper/lower-case lettering.
3. Sub-articles are the subordinate to article titles, which are printed in uppercase lettering.
4. Subordination (if any) of certain sections (or portions of sections) to other sections is described within those sections.
5. Underscoring is used strictly to assist the reader of specification text in scanning text for key words (for quick recall). No emphasis on or relative importance of text is intended where underscoring is used.
6. Imperative language is used generally in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.
7. Section numbering is used to facilitate cross references in the contract documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and names of specification sections in contract documents.



8. Page Numbering: Pages are numbered independently for each section and are recorded in the listing of sections (Index or Table of Contents) in Project Manual. The section number is shown together with the page number at the bottom of each page to facilitate the location of text in the Project Manual.
  9. Project Identification: Project name (either complete or abbreviated) is recorded at top of each page of specifications to minimize possible misuse of specifications, or confusion with other project specifications.
- C. Specification Content: Because of methods by which the project specification has been produced, certain general characteristics of content and conventions in use of language are explained as follows:
1. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive," "open generic-descriptive," "compliance with standards," "performance," "proprietary," or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.
  2. Overlapping and Conflicting Requirements: Where compliance with 2 or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement is intended and will be enforced, unless specifically detailed language written into the contract documents clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Architect/Engineer for a decision before proceeding.
  3. Contractor's Options: Except for overlapping or conflicting requirements, where more than one set of requirements are specified, for a particular unit of work, option is intended to be Contractor's regardless of whether or not it is specifically indicated as such.
- D. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended to be the minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of the requirements. Refer instances of uncertainty to Architect/Engineer for decision before proceeding.
- E. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements should not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the work; they are also not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of entire set of contract requirements remains with the Contractor.
- F. Trades: Except as otherwise indicated, the use of titles such as "carpentry" in specification text, implies neither that the work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by tradespersons of that corresponding generic name.

- G. Abbreviations: The language of specifications and other contract documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in the texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirements with notations on drawings and in schedules. These are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated.
1. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the contract documents so indicates.

#### **1.05 DRAWING SYMBOLS**

- A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards," published by John Wiley & Sons, Inc., seventh edition.
- B. Mechanical/Electrical Drawings: Graphic symbols used on mechanical and electrical drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, these symbols are supplemented by more specific symbols as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect/Engineer for clarification before proceeding.

#### **1.06 INDUSTRY STANDARDS**

- A. General Applicability of Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, applicable standards of the construction industry have the same force and effect (and are made a part of contract documents by reference) as if copied directly into the contract documents, or as if published copies were bound herewith. Refer to other contract documents for resolution of overlapping and conflicting requirements which result from the application of several different industry standards to the same unit of work. Refer to individual unit of work sections for indications of which specialized codes and standard the Contractor must keep at the project site, available for reference.
1. Referenced standards (referenced directly in contract documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to work. See also Chapter 35 of the CBC.
  2. Non-referenced standards are hereby defined to have no particular applicability to the work, except as general requirements of whether the work complies with standards recognized in the construction industry.
- B. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents.
1. Updated Standards: At the request of the Architect/Engineer, Contractor or governing authority, submit a change order proposal where an applicable industry code or standard has been revised and reissued after the date of the contract documents and before the performance of the work affected. The Architect/Engineer will decide whether to issue the change order to proceed with the updated standard.

- C. Copies of Standards: The contract documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work. Copies of applicable standards are not bound with the contract documents.
1. Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.
  2. Although certain copies of standards needed for enforcement of the requirements may be required submittals, the Architect/Engineer reserves the right to require the Contractor to submit additional copies of these standards as necessary for enforcement of the requirements.
- D. Abbreviations and Names: The following acronyms or abbreviations as referenced in contract documents are defined to mean the associated names. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of contract documents:

AA	Aluminum Association 1525 Wilson Boulevard, Suite 600, Arlington, VA 22209 <a href="http://www.aluminum.org">www.aluminum.org</a>
AAMA	American Architectural Manufacturers Association 1827 Walden Office Square, Suite 550, Schaumburg, IL 60173-4268 <a href="http://www.aamanet.org">www.aamanet.org</a> ; 847.303.5664
AAN	American Association of Nurserymen 1200 G St. Suite 800; Washington, DC 20005 <a href="http://www.anla.org">www.anla.org</a> ; 202 789 2900
AASHTO	American Association of State Highway & Transportation Officials 444 N. Capitol St.; Washington, DC 20001 <a href="http://www.transportation.org">www.transportation.org</a> ; 202 624 5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215; Research Triangle Park, NC 27709-2215 <a href="http://www.aatcc.org">www.aatcc.org</a> ; 919 549 8141
ACA	American Coatings Association 1500 Rhode Island Ave., NW; Washington, DC 20005 <a href="http://www.paint.org">www.paint.org</a> ; 202-462-6272
ACI	American Concrete Institute 38800 Country Club Dr., Farmington Hills, MI 48331-3439 <a href="http://www.concrete.org">www.concrete.org</a> ; 313 532-2600
ACIL	American Council of Independent Laboratories 1725 K Street, NW; Washington, DC 20006 <a href="http://www.acil.org">www.acil.org</a> ; 202 887-5872
ACPA	American Concrete Pipe Association

8445 Freeport Parkway, Suite 350, Irving TX 75063-2595  
www.concrete-pipe.org 972 506 7216

AF&PA	American Forest & Paper Association 1111 19 <sup>th</sup> St. NW, Suite 800, Washington, CD 20036 www.afandpa.org
AGA	American Gas Association 400 N. Capitol St. NW, Washington DC 20001 www.aga.org 202 824 7000
AHAM	Association of Home Appliance Manufacturers 1111 19 <sup>th</sup> St. NW, Suite 402, Washington, DC 20036 www.aham.org 202 872 5955
AI	Asphalt Institute 2696 Research Park Drive, Lexington, KY 40511-8480; www.asphaltinstitute.org 859 288 4960
AIA	American Institute of Architects 1735 New York Ave. NW; Washington, DC 20006-5292 www.aia.org 800 242 3837
A.I.A.	American Insurance Association 2101 L Street NW, Suite 400, Washington DC 20037 www.aiadc.org 202 828 7100
AISC	American Institute of Steel Construction One East Wacker Drive, Suite 700, Chicago, IL, 60601-18021 www.aisc.org 312 670 2400
ANSI	American Iron and Steel Institute 25 Massachusetts Ave NW Suite 800, Washington, DC 20001 www.steel.org 202 452 7100
AITC	American Institute of Timber Construction www.aitc-glulam.org 503 639 0651
ALSC	American Lumber Standard Committee, Inc. P.O. Box 210; Germantown, MD 20875-0210; www.alsc.org 301 972 1700
ANSI	American National Standards Institute 25 West 43 <sup>rd</sup> St. 4 <sup>th</sup> Floor, New York, NY 10036 www.ansi.org 212 642 4900
APA	American Plywood Association 7011 South 19 <sup>th</sup> , Tacoma, WA 98466; www.apawood.org 253 620 7400

ARI	Air Conditioning, Heating and Refrigeration Institute 2111 Wilson Blvd, Suite 500.; Arlington, VA 22201; www.ahrinet.org 703 524 8800
ASC	Adhesive and Sealant Council 7101 Wisconsin Ave, Ste 990, Bethesda, MD 20814; 301-986-9700 www.ascouncil.org
ASCE/SEI	American Society of Civil Engineers Structural Engineering Institute 1801 Alexander Bell Drive, Reston, VA 20191-4400 www.asce.org; 800 548 2723
ASHRAE	American Society of Heating, Refrigerating & Air Conditioning Engineers 1719 Tullie Circle, NE; Atlanta, GA 30329; www.ashrae.org ; 404 636 8400
ASME	American Society of Mechanical Engineers Three Park Ave, New York, NY 10016-5990 www.asme.org; 800-843-2763
ASPE	American Society of Plumbing Engineers 2980 S. River Road; Des Plaines, IL 60018 www.aspe.org; 847-296-0002
ASSE	American Society of Sanitary Engineers-CA Chapter 1111 W. James Wood Blvd.; Los Angeles, CA 90015 www.asse-plumbing.org; 213-688-9090
ASTM	American Society for Testing and Materials 100 Barr Harbor Dr / PO Box C700, West Conshohocken, PA 19428 www.astm.org; 215 299-5400
AWI	Architectural Woodwork Institute 46179 Westlake Drive;, Ste 120; Potomac Falls, VA 20165 571-323-3636
AWS	American Welding Society 8669 Doral Boulevard, Suite 130, Doral FL 33166 www.aws.org; 800 443 9353
AWPA	American Wood Protection Association P.O. Box 361784; Birmingham AL 35236-1784 www.awpa.com
AWWA	American Water Works Association 6666 W. Quincy Ave., Denver, CO 80235 303-794-7711
BHMA	Builders' Hardware Manufacturers Association

355 Lexington Ave 17<sup>th</sup> Floor, New York, NY 10017;  
www.buildershardware.com; 212-297-2122

BIFMA	Business and Institutional Furniture Manufacturer's Association 678 Front Ave NW, Ste. 150; Grand Rapids, MI 49504-5368; 616-285-3963
CBMA	Certified Ballast Manufacturers 2122 Keith Bldg.; Cleveland, OH 44115; 216 241-0711
CDA	Copper Development Association 260 Madison Ave; New York, NY 10016; 212-251-7200
CISPI	Cast Iron Soil Pipe Institute 1064 Dleaware Ave. SW, Atlanta, GA 30316 www.cispi.org; 404 622 0073
CPA	Composite Panel Association 19465 Deerfield Ave. Suite 306, Leesburg, VA 20176 www.compositepanel.org
CPSC	Consumer Product Safety Commission 4330 East West Highway; Bethesda, MD 20814-4408; 301-504-7923
CRI	Carpet and Rug Institute Box 2048/730 College Dr.; Dalton, GA 30720; 706-278-3176
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Rd.; Schaumburg, IL 60173; 847-517-1200
CSA	Canadian Standards Association 5060 Spectrum Way, Mississauga, Ontario, Canada L4W 5N6
CSI	Construction Specifications Institute 110 South Union St., Ste. 100; Alexandria, VA 22314; 800-689-2900 www.csinet.org
CTI	Ceramic Tile Institute 310-574-7800
DHI	Door and Hardware Institute 14150 Newbrook Drive, Ste. 200; Chantilly, VA 20151-2232 www.dhi.org; 703-222-2010
DLPA	Decorative Laminate Products Association (Formerly National Association of Plastic Fabricators) Hulman Building; 20th Floor; 120 West Second Street; Dayton, OH 45402; 513/228-1041

DOC	US Dept. of Commerce, National Institute of Standards and Technology 1401 Constitution Avenue NW, Washington DC 20230
DOJ	US Department of Justice 950 Pennsylvania Ave. NW Civil Rights Division, Disability Rights Section-NYA Washington DC 20530
DOTn	Department of Transportation 1200 New Jersey Ave, SE; Washington, DC 20402-9325 202 426 4000
EIA	Electronic Industries Association 2001 Eye St., NW; Washington, DC 20006; 202 457-4900
EPA	Environmental Protection Agency 2001 Eye St., NW; Washington DC 20006; www.epa.gov; 202 457 4900
FEMA	Federal Emergency Management Agency, Federal Center Plaza 500 C St. S.W., Washington DC 20472 www.fema.gov
FGMA	Flat Glass Marketing Association White Lakes Professional Bldg; 3310 Harrison; Topeka, KS 66611; 913 266-7013
FM	Factory Mutual Global Research, Standards Laboratory Dept.. 1301 Attwood Ave. POB 7500, Johnson, RI 02919; www.fmglobal.com
GA	Gypsum Association 810 First St. N.E. #510, Washington, DC 20002-4268 www.gypsum.org; 301 277 6886
HMMA	Hollow Metal Manufacturers Association See NAAMM below.
HPVA	Hardwood Plywood Veneer Association 1825 Michael Farraday Dr., Reston, VA 20190 www.hpva.org
HUD	US Dept. of Housing and Urban Development 451 7 <sup>th</sup> St. SW, Washington, DC 20410
IBC	International Building Code 500 New Jersey Ave. NW 6 <sup>th</sup> Floor, Washington, DC 20001 www.iccsafe.org

ICC	International Code Council 500 New Jersey Ave NW, 6 <sup>th</sup> Floor, Washington DC 20001 <a href="http://www.iccsafe.org">www.iccsafe.org</a>
IEEE	Institute of Electrical and Electronic Engineers, Inc. 3 Park Ave, 17 <sup>th</sup> Floor; New York, NY 10016 212-419-7900
IES	Illuminating Engineering Society 120 Wall St., Floor 17, New York, NY 10005-4001 212-248-5000
IRI	Industrial Risk Insurers 85 Woodland St.; Hartford, CT 06102; 203/525-2601
ISO	International Organization for Standardization ISO Central Secretariat 1 ch. De la Voie-Creuse, Case Postale 56 CH-1211 Geneva 20, Switzerland <a href="http://www.iso.org">www.iso.org</a>
MCAA	Mechanical Contractors Association of America 1385 Piccard Dr.; Rockville, MD 20850; 301-869-5800
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park St. NE; Vienna VA 22180-4602; 703-281-6613
NAAMM	National Association of Architectural Metal Mfrs. 800 Roosevelt Rd. Bldg C, Ste 312; Glen Ellyn, IL 60137 <a href="http://www.naamm.org">www.naamm.org</a> ; 630-942-6591
NBHA	National Builders Hardware Association (No Part of HDI) 711 Old Springhouse Rd.; McLean, VA 22101; 703 556-3990
NBS	National Bureau of Standards (U.S. Dept. of Commerce) Gaithersburg, MD 20234; 301 921-1000
NCMA	National Concrete Masonry Association 13750 Sunrise Valley, Herndon, VA 22071-4662
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Ste. 1100; Bethesda, MD 20814; 301 657 3110
NEII	National Elevator Industry, Inc. 1677 Country Route 64/PO Box 838; Salem, NY 12865-0838 518-854-3100
NEMA	National Electrical Manufacturers Association



1300 North 17<sup>th</sup> Street, Ste. 1752, Rosslyn, VA 22209; 703-841-3200

NFPA	National Fire Protection Association 1 Batterymarch Park, Quincy, MA 02169-7471 www.nfpa.org; 617 770 3000
NHLA	National Hardwood Lumber Association P.O. Box 34518; Memphis, TN 38104; 901 377-1818 www.nhla.com
NIST	National Institute of Standards and Technology (US Dept. of Commerce) 1401 Constitution Avenue NW, Washington DC 20230 www.nist.gov
NRCA	National Roofing Contractors Association 10255 W. Higgins Rd., Ste. 600, Rosemont, IL 60018-5607 www.nrca.net; 847-299-9070
NSF	National Sanitation Foundation P.O. Box 130140/789 N. Dixboro Road, Ann Arbor, MI 48113-0140 www.nsf.org 800-673-6275
OSHA	Occupational Safety & Health Administration (U.S. Dept. of Labor) 200 Constitution Ave; Washington, DC 20210 www.osha.gov 800-321-6742
PCI	Precast Prestressed Concrete Institute 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606-6938 www.pci.org
PDI	Plumbing and Drainage Institute 800 Turnpike Street, Ste. 300; North Andover, MA 01845 www.pdionline.org 978-557-0720
PTI	Post-Tensioning Institute 38800 Country Club Dr., Farmington Hills, MI 48331 www.post-tensioning.org
RFCI	Resilient Floor Covering Institute 115 Broad Street, Ste. 201; La Grange, GA 30240 www.rfci.com
RIS	Redwood Inspection Service (Grading Rules) 818 Grayson Rd., Ste. 201; Pleasant Hill, CA 94523 www.redwoodinspection.com 925-935-1499
SDI	Steel Deck Institute POB 25, Fox River Grove, IL 60021 www.sdi.org
S.D.I.	Steel Door Institute

	30200 Detroit Rd.; Westlake, OH 44145 www.steeldoor.org 440-899-0010
SFM	State of California, Dept. of Forestry and Fire Protection Office of the State Fire Marshal, POB 944246, Sacramento, CA 94246 osfm.fire.ca.gov
SGCC	Safety Glazing Certification Council 100 W. Main St. / PO Box 730; Sackets Harbor, NY 13685; 315-646-2234
SJI	Steel Joist Institute 1173B London Links Dr., Forest, VA 24551 steeljoist.org
SMACNA	Sheet Metal & Air Conditioning Contractors' National Association 4201 Lafayette Center Drive;, Chantilly, VA 20151-1219 www.smacna.org 703-803-2980
SPRI	Single-ply Roofing Institute 411 Waverly Oaks Rd., Suite 331B, Waltham, MA 02452 www.spri.org
SSPC	Steel Structure Painting Council (The Society for Protective Coatings) 40 24 <sup>th</sup> Street, 6 <sup>th</sup> Floor, Pittsburgh, PA, 15222-4656 www.sspc.org
TCNA	Tile Council of North America 100 Clemson Research Blvd., Anderson, SC 29625, www.tcnatile.com 864-646-8453
TIA	Telecommunications Industry Association 2500 Wilson Blvd., Ste 300; Arlington VA 22201 www.tiaonline.org 703-907-7700
TMS	The Masonry Society 3970 Broadway, Unit 201-D, Boulder, CO 80304-1135 www.masonrysociety.org
TPI	Truss Plate Institute 218 N. Lee St., Suite 312, Alexandria, VA 22314 www.tpinst.org
UL	Underwriters Laboratories 333 Pfingsten Rd.; Northbrook, IL 60062-2096 www.ul.com 847 272 8800
ULC	Underwriters Laboratories of Canada 7 Underwriters Rd., Toronto, Ontario, Canada M1R3B4 www.ul.com/Canada/eng/pages/aboutus/

USC	United States Code, c/o Superintendent of Documents US Government Printing Office, Washington, DC 20402-9325
WCLIB	West Coast Lumber Inspection Bureau (Grading Rules) P.O. Box 23145; Portland, OR 97281 www.wclib.org 503 639 0651
WDMA	Window and Door Manufacturers Association 1400 E. Touhy, #470, Des Plaines, IL 60018 www.wdma.com
WI (WIC)	Woodwork Institute PO Box 980247; West Sacramento, CA 95798 www.wicnet.org 916-372-9943
WRI	Wire Reinforcement Institute 942 Main Street; Hartford, CT 06103 www.wirereinforcementinstitute.org
WSC	Water Systems Council 1101 30 <sup>th</sup> Street Northwest; Washington, DC 20007-3708 www.watersystemscouncil.org 888 395 1033
WWPA	Western Wood Products Association (Grading Rules) 522 SW Fifth Ave., Ste. 500; Portland, OR 97204-2122 www.wwpa.org 503 224-3930
W.W.P.A	Woven Wire Products Association www.wovenwire.org

### **1.07 GOVERNING REGULATIONS/AUTHORITIES**

- A. General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing contract documents; recognizing that such information may or may not be of significance in relation to Contractor's responsibilities for performing the work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of the work.
  
- B. Trade Union Jurisdiction: It is a procedural requirement that the Contractor maintain and require prime subcontractors to maintain, complete current information on jurisdictional matters, regulations actions, and pending actions, as applicable to the work.
  - 1. Discuss new developments at appropriate project meetings at the earliest feasible dates.
  - 2. Record information of relevance along with the action agreed upon.
  - 3. The manner in which contract documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements.
  - 4. Assign and subcontract the work, and employ tradesmen and laborers, in a manner which will not unduly risk jurisdictional disputes of a kind which could result in conflicts, delays, claims and losses in the performance of the work.

### **1.08 SUBMITTALS**

- A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgements, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

### **PART 2 PRODUCTS**

Not Used

### **PART 3 EXECUTION**

Not Used

**END OF SECTION**

## SECTION 01 4523

### TESTING AND INSPECTION SERVICES

#### PART 1 GENERAL

##### 1.01 DESCRIPTION

- A. Work Included:
1. Selection and payment of Testing and Inspection Agency
  2. Testing and Inspection Agency submittals.
  3. Testing and Inspection Agency responsibilities.
  4. Testing and Inspection Agency reports.
  5. Limits on Testing and Inspection authority.
  6. Contractor's Responsibilities.
  7. Architect's Responsibilities.

##### 1.02 RELATED SECTIONS

- A. Related Sections:
1. Drawings and Contract Documents, including General and Supplemental General Conditions.
  2. Section 01 3300 - Submittals: Manufacturer's certificates.
  3. Section 01 3200- Construction Progress Schedule.
  4. Section 01 4000 - Quality Control.
  5. Section 09 0512 - Concrete Floor Moisture Content & pH Testing
  6. Section 01 7000 - Contract Closeout: Project Record Documents.
  7. Section 01 7500 - Starting of Systems.
  8. Technical Specifications - Pertinent Sections requiring tests and inspections.

##### 1.03 REFERENCES

- A. ASTM C802 - Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction.
- B. ASTM C1021 - Practice for Laboratories Engaged in the Testing of Building Sealants.
- C. ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- D. ASTM C1093 - Practice for Accreditation of Testing Agencies for Unit Masonry.
- E. ASTM D290 - Recommended Practice for Bituminous Mixing Plant Inspection.
- F. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- G. ASTM D4561 - Practice for Quality Control Systems for an Inspection and Testing Agency for Bituminous Paving Materials.

- H. ASTM E329 - Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction.
- I. ASTM E543 - Practice for Determining the Qualification of Nondestructive Testing Agencies.
- J. ASTM E548 - Practice for Preparation of Criteria for Use in the Evaluation of Testing Laboratories and Inspection Bodies.
- K. ASTM E699 - Practice for Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E6.

#### **1.04 SELECTION AND PAYMENT**

- A. An independent testing laboratory approved by DSA shall perform inspections, tests, and other services as specified by various specification sections.
  - 1. Owner will employ and pay for testing laboratory to provide initial testing indicated under specific specification sections and specifically noted to be paid by the Owner.
  - 2. Contractor shall be back-charged for testing costs when:
    - a. Additional tests and inspections by Owner's testing agency where initial tests and inspections reveal failure to meet Contract requirements.
    - b. Excessive inspection time by Owner's testing agency is required by Contractor's failure to provide sufficient workman or to properly pursue the progress of work.
    - c. Test(s) deemed necessary by the Owner/ Architect to evaluate any substitution proposed by the Contractor.
    - d. Testing and inspection for the Contractor's convenience.
    - e. Testing and inspection overtime necessitated by the Contractor's schedule.
- B. Employment of inspection firm in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Employment of any testing laboratory by Contractor shall be subject to Owner approval; laboratory shall be under direct supervision of a registered Engineer and shall conform to ASTM 329. Laboratory of concrete producer shall not be acceptable for concrete mix designs.
- D. Owner reserves the right to test any material or work of Project at any time, whether or not tests are indicated in Contract Documents.

#### **1.05 QUALITY ASSURANCE**

- A. Conform to requirements of the referenced standards.
- B. Laboratory: Authorized to operate in State in which Project is located.
- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

#### **1.06 CONTRACTOR SUBMITTALS**

- A. Prior to start of Work, submit testing laboratory OR inspection firm's name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Each Contractor responsible for the construction of a main wind- or seismic-force resisting system, designated seismic or a wind- or seismic-resisting component list in the statement of special inspections shall submit a written statement of responsibility prior to commencement of work on the system or component. A copy of this written statement shall be maintained at the project site and made available upon request. The Contractor's statement of responsibility shall contain the following:
  - 1. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
  - 2. Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the building official;
  - 3. Procedures for exercising control within the Contractor's organization, the method and frequency of reporting and the distribution of the reports; and
  - 4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.
- C. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

#### **1.07 AGENCY RESPONSIBILITIES**

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.
- C. Perform specified sampling and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect/Engineer and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional tests required by Architect/Engineer.
- G. Attend preconstruction meetings and progress meetings.

#### **1.08 AGENCY AND INSPECTION REPORTS**

- A. After each test, observation or inspection, promptly submit copies of report to Architect, Engineer, DSA, Owner's Inspector, Owner, Contractor and as otherwise directed.
- B. Include:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Name of inspector.
  - 4. Date and time of sampling or inspection.
  - 5. Identification of product and specifications section.

6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

C. When requested by Architect/Engineer, provide interpretation of test or inspection results.

#### **1.09 LIMITS ON TESTING and INSPECTION AUTHORITY**

- A. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Agency or laboratory may not approve or accept any portion of the Work.
- C. Agency or laboratory may not assume any duties of Contractor.
- D. Agency or laboratory has no authority to stop the Work.

#### **1.10 CONTRACTOR RESPONSIBILITIES**

- A. Provide information regarding activities requiring special inspection and tests to District's inspection and testing laboratory upon request.
- B. Provide agency or laboratory representative access to any chosen location and adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- C. Cooperate with laboratory personnel, and provide access to the Work.
- D. Provide incidental labor and facilities:
  1. To provide access to Work to be tested.
  2. To obtain and handle samples at the site or at source of Products to be tested.
  3. To facilitate tests.
  4. To provide storage and curing of test samples.
- E. Notify agency or laboratory and Architect/Engineer forty-eight (48) hours prior to expected time for operations requiring testing services. Become familiar with time constraints of tests required. Schedule work to allow time for performance of required tests.
- F. Employ services of an independent qualified testing laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

#### **1.11 ARCHITECT RESPONSIBILITIES**

- A. Architect is not responsible for notification of the Testing Agency or scheduling its work.
- B. Architect will not be responsible for the actions of the Testing Agency.



**1.12 RE-TESTING**

- A. When initial tests indicate non-compliance with the Contract Documents, subsequent re-testing shall be performed by the same testing laboratory and the costs thereof shall be paid by the Owner and deducted from the Contract Sums owed to the Contractor.

**1.13 SCHEDULE OF INSPECTIONS**

- A. Division of State Architect Form SSS-103 SCHEDULE OF TESTS AND INSPECTIONS is attached.
- B. Individual Specification Sections: Other tests or inspections required; standards for testing.

**PART 2 PRODUCTS - NOT USED.**

**PART 3 EXECUTION - NOT USED.**

**END OF SECTION**

DIVISION OF STATE ARCHITECT FORM SSS-103 SCHEDULE OF TESTS AND INSPECTIONS FOLLOWS  
THIS SECTION

## SECTION 01 5000

### TEMPORARY FACILITIES

#### PART 1 GENERAL

##### 1.01 SCOPE

- A. Provide all required temporary facilities and controls as shown or specified herein and such additional facilities as required for proper performance of the work.
- B. All such temporary facilities shall be located where directed and maintained in a safe and sanitary condition at all times until completion of the contract and then removed from the site for safe disposal.

##### 1.02 TEMPORARY SANITARY FACILITIES

- A. Provide adequate temporary sanitary conveniences for the use of all employees and persons engaged on the work including subcontractors and their employees as required by law, ordinances or regulations of public authorities having jurisdiction.
- B. Toilet Facilities: Enclosed chemical toilets or water closets and urinals, types acceptable to the Architect, Owner and Authorities Having Jurisdiction.
  - 1. If fixtures are used, they shall not be incorporated into the building.
  - 2. Open pit or trench latrines will not be permitted.
- C. Permanent plumbing fixtures of the building shall not be used by construction personnel without the written consent of the Owner.
- D. Sanitary facilities locations shall be acceptable to the Architect and Owner and shall be maintained in a clean and sanitary condition during the entire course of the work. The Contractor shall keep such facilities adequately supplied with toilet paper, paper toweling, etc. as required.
- E. At completion of the work sanitary facilities shall be properly disinfected and all evidence of same removed from the site.

##### 1.03 TEMPORARY ELECTRIC FACILITIES

- A. Provide and maintain during the progress of the work all temporary electrical power and wiring requirements to facilitate the work of all trades and services connected with the work. All payment required by the utility company for the cost of their work in providing the service installation shall be paid for by the Contractor.
- B. The Owner will permit the operation or use of portions of the permanent electrical system to provide light and power during the construction period.
- C. The Contractor shall provide adequate temporary lighting for all work.

#### **1.04 TEMPORARY WATER**

- A. The Contractor shall make arrangements for all water required for construction purposes. The Contractor shall furnish and install piping or hose to carry water to every point where needed on the project. All water used on the project shall be potable water.
- B. The Owner will permit the operation or use of portions of the permanent water system to provide water required for construction purposes during the construction period.
- C. Closest availability of water shall be determined by the Contractor.

#### **1.05 CONSTRUCTION EQUIPMENT**

- A. The Contractor shall erect, equip and maintain all construction equipment in strict accordance with all applicable statutes, laws, ordinances, rules and regulations of the Owner or other authority having jurisdiction. Provide as required for use of all trades. Hoists and scaffolding shall be installed and erected in accordance with the latest Construction Safety Orders issued by the Division of Industrial Safety, State of California and the Associated General Contractor's "Manual of Accident Prevention in Construction," latest edition.
- B. Scaffolding, staging, runways and similar equipment required for prosecution of the contract shall be provided and maintained by the Contractor.
- C. Hoists and construction elevators required for prosecution of the contract shall be provided and maintained by the Contractor complete with operators, power and signals as required.
- D. The Contractor shall provide, maintain and remove upon completion of the work all temporary rigging, scaffolding, hoisting equipment, rubbish chutes, barricades around openings and excavations, ladders between floors, fences and all other temporary work as required for all work hereunder.
- E. Temporary work shall conform to all the requirements of state, county and local authorities and underwriters which pertain to operation, safety and fire hazard. The Contractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for under the separate divisions of these specifications.

#### **1.06 FENCES AND BARRICADES**

- A. Construct and maintain fences, planking, barricades, lights, shoring and warning signs as required by local authorities and state safety ordinances and as required to protect the Owner's property from injury or loss and as necessary for the protection of the public and provide walks around any obstructions made in a public place for carrying on the work covered in this contract. Leave all protection in place and maintain until removal is authorized.
- B. Security fencing shall be located such that clear and unobstructed access is maintained to all existing school facilities.
- C. Relocate fences and barricades as allowed by the progress of the work to minimize the area enclosed. Avoid unnecessary encroachment on existing facilities.

### **1.07 PARKING AND EXTERIOR STORAGE**

- A. The Contractor shall make all arrangements and pay all costs for providing parking facilities for construction personnel, delivery vehicles and authorized visitors.
- B. Where space limitations will not permit adequate facilities within the Owner's property, arrangements for off-property facilities shall be made by the Contractor with city or county authorities or other parties having jurisdiction.
- C. The Contractor shall make similar arrangements for hardstands or other necessary provision for enclosed storage areas for materials, equipment and debris. Locations and perimeters of such facilities shall be subject to the approval of the Architect and authorities having jurisdiction.

### **1.08 TEMPORARY FIELD OFFICES**

- A. Contractor Field Office: Contractor shall provide on the site a temporary field office with a minimum of two individual offices of suitable size for Contractor staff use and for consultations with representatives of the Architect and Owner. Field Office facility shall be:
  - 1. Weatherproof and secure,
  - 2. Provided with adequate lighting, heat, cooling and ventilation.
  - 3. Equipped with a plan rack and plan table, containing a complete set of Contract Documents at all times.
  - 4. Provide conference table and chairs to seat eight (8) persons with such additional furniture as the Contractor may require.
  - 5. Provide a temporary telephone, separate line for fax and internet connection with wireless service as hereinafter specified.
  - 6. Field office location shall be approved by the Architect prior to placing the building on the site.
  - 7. The Architect and Owner and their representatives shall have free access to the field office at all times.
  - 8. The field office shall remain the property of the Contractor and shall be removed from the site upon completion of the work.
  - 9. A suitable office trailer, meeting all foregoing requirements, may be provided for the job office at the Contractor's option.
- B. Inspector Field Office: The Contractor shall provide on the site a temporary job office with a minimum of two individual offices of suitable size for the Inspector of Record. Provide the following facilities:
  - 1. Weatherproof and secure;
  - 2. Provided with adequate lighting, heat, cooling and ventilation.
  - 3. Equipped with a plan rack and plan table and shall contain a complete set of Contract Documents at all times.
  - 4. Sturdy desk with file drawers and chair. The Inspector may provide additional furniture as he or she may require.
  - 5. Copy Machine as hereinafter specified.
  - 6. Provide temporary telephone lines, separate line(s) for fax and all handsets, fax terminal equipment and wireless internet connection with wireless service as hereinafter specified.
  - 7. Inspector's field office location shall be approved by the Architect and Inspector prior to placing the building on the site.
  - 8. The Architect and Owner and their representatives shall have free access to the Inspector's field office at all times. Contractor shall not have access to the Inspector's office.

9. The Inspector's field office shall remain the property of the Contractor and shall be removed from the site upon completion of the work. The Inspector will be responsible for removing his or her files and equipment.

C. Owner will not provide office space or furniture for the Contractor's use.

D. Contractor shall relocate field offices as progress of the work may require.

#### **1.09 TEMPORARY TELEPHONE, FAX, INTERNET CONNECTION AND OFFICE EQUIPMENT**

A. Provide temporary telephone, facsimile (fax) service and internet connection in the temporary field offices for use by the Contractor, Owner, Architect, Inspector and their representatives for purposes related to the work. The telephone, fax and internet connection shall be for the use of representatives mentioned above for local calls without charge to the caller.

B. Fax equipment shall be plain paper type.

C. Provide separate telephone lines, fax lines and internet connection as follows:

1. Contractor's Field Office: Two (2) Phone lines; One (1) fax line; one (1) internet connection.
2. Inspector's Field Office: Two (2) Phone lines; One (1) fax line; one (1) internet connection.

D. Inspector's Copy Machine: Provide copy machine service in the temporary Inspector's offices for use by the Owner, Architect, Inspector and their representatives for purposes related to the work. Contractor shall not use Inspector's copy machine.

E. Contractor's Copy Machine: Contractor's Option, provide copy machine service in the temporary Field offices for use by the Contractor.

F. Contractor's Responsibility for Costs: Make all arrangements and pay all costs, including service, maintenance and consumable supplies for the specified equipment, until final acceptance of the project.

#### **1.10 TEMPORARY HEATING, COOLING, VENTILATING**

A. Provide temporary heating, cooling, dehumidification and ventilation from an approved source whenever necessary for curing, drying, cooling or warming spaces as may be required for the installation of materials or finishes in specified conditions.

B. Maintain facilities or equipment as required for continuous operation of utilities in service. Do not allow interruption of utilities or services. Supply all fuel of types required.

C. Continue temporary services uninterrupted until permanent building systems are completed, capable of maintaining specified conditions without supplemental equipment, and accepted by the Owner.

#### **1.11 CONTINUITY OF SERVICES**

A. Provide temporary panels, raceway, conductors, piping, ductwork and other facilities or equipment as required for continuous operation of utilities in service. Do not allow interruption of utilities.

1. All utility services, such as water, gas, sewers, electricity, data, cable television, communication, clock, bell, or fire protection system serving the project, or any part of it, shall be maintained in continuous operation at all times for the duration of the contract.
2. Transfer of utilities function to new systems shall be coordinated in writing with the Owner at least two weeks in advance of the proposed date.
3. Notify and obtain approval from agencies having jurisdiction over utilities prior to transfer of function.
4. Coordinate provision and removal of temporary facilities with phasing of construction operations as indicated, or as necessary for continuity of service.

**1.12 REMOVAL AT COMPLETION**

- A. Upon completion of the work, or prior thereto when so directed by the Architect, the Contractor shall remove all temporary facilities, structures and installations from the Owner's property. Similarly, return all exterior areas utilized for temporary facilities to their original natural state or, when called for as part of the Work, complete areas as shown or noted.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

**END OF SECTION**

## SECTION 01 5600

### TEMPORARY CONTROLS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Barriers, enclosures and fencing.
- B. Dust control.
- C. Water control.
- D. Weed control.
- E. Protection of Installed Work.
- F. Exterior Protection.
- G. Tree and Plant Protection.
- H. Resource Protection.
- G. Progress Cleaning.

##### 1.02 BARRIERS

- A. Construct and maintain any necessary fences, barricades and warning signs as required by local authorities and state safety ordinances and as required to protect the Owner's property from injury or loss. Leave all protection in place and maintain until removal is authorized.
- B. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

##### 1.03 DUST CONTROL

- A. Control dust on the site. Maintain measures to prevent dust and debris from being transported outside the area of Work. Assume responsibility for damage caused by dust to the Work and for damage caused by dust outside the area of Work. Correct damages at Contractor's expense.
- B. Refer to Division 2 sections for additional requirements.

##### 1.04 WATER CONTROL

- A. Grade site to drain. Provide, operate, and maintain pumping equipment as required to maintain excavations and site construction areas free of water.

- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Do not permit water to stand in locked-in areas of buildings to receive concrete slabs-on-grade, nor on such slabs following their placement. Provide pumping or dewatering facilities and monitor during storm events to prevent these conditions.

#### **1.05 WEED CONTROL**

- A. Remove weeds from site that grow over the duration of the project.
- B. Prevent incorporation of organic materials into grading or topdressing.

#### **1.06 PROTECTION OF INSTALLED WORK**

- A. Protect installed Work throughout to maintain undamaged. Provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- D. Prohibit traffic from landscaped areas.

#### **1.07 EXTERIOR PROTECTION**

- A. Provide temporary weather-tight enclosure of exterior walls for successive areas of building as necessary to:
  - 1. Allow for progress of work;
  - 2. Provide acceptable working conditions;
  - 3. Provide weather protection for materials;
  - 4. Permit effective heating, cooling, dehumidification or ventilation as circumstances may require;
  - 5. Prevent entry of unauthorized persons.
- B. Bear all costs for replacement of damage to existing or new construction, construction materials and equipment from effects of weather, theft and unauthorized entry.

#### **1.08 TREE AND PLANT PROTECTION**

- A. Preserve and protect existing trees and plants at site which are designated to remain, and those adjacent to site.
- B. Following consultation with Architect, remove roots and branches which interfere with indicated construction.
  - 1. Employ a qualified tree surgeon to prune and treat cuts.
- C. Provide temporary barriers to a height of six feet, around each, or around each group, of trees and plants.



- D. Protect root zones of trees and plants:
  - 1. Do not allow vehicular traffic and parking.
  - 2. Do not store materials or products.
  - 3. Prevent dumping of refuse or chemically injurious materials or liquids.
  - 4. Prevent puddling or continuous running water.
- E. Carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage.
- F. Replace, or suitably repair, trees and plants designated to remain which are damaged or destroyed due to construction operations.

#### **1.09 PROGRESS CLEANING AND WASTE REMOVAL**

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition. Provide on-going, daily housekeeping and cleanup, including all debris boxes or method for disposal of debris. Contractor will not be permitted to leave debris, trash, leavings, dirt, garbage, rubbish, material containers, etc. on the site. No unsafe and un-workmanlike conditions will be permitted.
- B. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

#### **1.10 REMOVAL OF CONTROLS**

- A. Remove temporary controls prior to inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition.

### **PART 2 PRODUCTS**

Not Used.

### **PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## SECTION 01 6000

### PRODUCT REQUIREMENTS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.
- E. Procedures for Owner-supplied products.
- F. Spare parts and maintenance materials.

##### 1.02 RELATED SECTIONS

- A. Document 00 1013 - Notice Inviting Bids: Products designated by Owner as "District Standards."
- B. Document 00 2113 - Instructions to Bidders: Product options and substitution procedures prior to bid date.
- C. Document 00 7200 - General Conditions of the Contract: Product options and substitution procedures prior to bid date.
- D. Section 01 4000 - Quality Control: Product quality monitoring.

##### 1.03 DEFINITIONS

- A. Request For Substitution: Requests for changes in products, materials, or equipment required by Contract Documents proposed by the Contractor prior to and after award of the Contract are considered requests for substitutions. The following are not considered substitutions:
  - 1. Revisions to Contract Documents requested by the Owner or Architect.
  - 2. Specified options of products, materials, and equipment included in Contract Documents.

##### 1.04 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
  - 1. Submit within 15 days after date of Agreement.
  - 2. For products specified only by reference standards, list applicable reference standards.

- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
  - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's colors, textures, and patterns.
- E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances

## **PART 2 PRODUCTS**

### **2.01 PRODUCTS**

- A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- B. Provide interchangeable components of the same manufacture for components being replaced.
- C. Products or equipment referenced with a manufacturer's name and/or model number shall be provided with all standard materials, components, compliance requirements and features normally furnished for that model or product. These items and requirements are inherent in the specification whether or not individually itemized.
- D. Manufacturer's Requirements: Any deviation from design requirements shown or specified, resulting either from Contractor's or supplier's change of model, or manufacturer's recommendation, or from submitted alternates or accepted substitutions, shall be clearly indicated on the Contractor's submittals. Contractor shall provide all such manufacturer or supplier supplemental requirements at no additional cost.
- E. Owner's Requirements:
  - 1. Pursuant to the requirements of California Public Contract Code 3400, the Owner may designate certain products as "District Standards" in order that a field test or experiment may be made to determine the product's suitability for future use, or in order to match other products in use on a particular public improvement, either completed or in the course of construction.
  - 2. A list of these designated products as may be applicable to the project is contained in the Notice Inviting Bids, as required by PCC 3400. These products shall be provided as specified and are not subject to substitution. All bids shall be deemed to include these listed items as specified without additional costs.
  - 3. In the event of a conflict between the Notice Inviting Bids and the technical specifications for a product's provision for substitutions, the Notice Inviting Bids shall govern.

### **2.02 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

- B. Products Specified by Naming a Single Manufacturer with a Provision for Substitutions: Submit a request for substitution in accordance with specified procedures for products meeting specifications from any manufacturer not named. For such specifications, the Architect is aware of only one manufacturer providing products meeting the specification, pursuant to PCC 3400.
- C. Products Specified by Naming Multiple Manufacturers with a Provision for Substitutions: Submit a request for substitution in accordance with specified procedures for products meeting specifications from any manufacturer not named.
- D. Products Specified by Naming A Single Manufacturer or Multiple Manufacturers without Provision for Substitution: Use only a product of one of the manufacturers named and meeting specifications. No options or substitutions allowed.
- E. Products Specified by Naming A Single Manufacturer or Multiple Manufacturers as listed in the Notice Inviting Bids: Use only a product of one of the manufacturers named and meeting specifications. No options or substitutions allowed

### **2.03 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site, prior to final payment.
  - 1. Provide materials list for all items turned over to the Owner including quantities.
  - 2. Deliver items in presence of Owner designated representative to the location identified by the Owner.
  - 3. Obtain Owner designated representative sign-off of materials list attesting to receipt of items in triplicate. Retain one copy, provide one copy to Owner representative receiving items, and submit one copy to Architect.

## **PART 3 EXECUTION**

### **3.01 LIMITATIONS ON SUBSTITUTIONS SUBMITTED PRIOR TO THE RECEIPT OF BIDS**

- A. The Bid shall be based upon the standards of quality established by those items of equipment and/or materials which are indicated in the Contract Documents, including those products designated as "District Standards".
- B. Architect may consider requests for substitutions of specified equipment and/or materials only when requests are received by Architect within twenty-one (21) days prior to the date of bid, in conformance with Public Contract Code Section 3400. Do not request substitutions for products designated as "District Standards".
- C. Architect will consider a substitution request only if request is made in strict conformance with provisions of this Section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in this section in the article titled PRODUCTS.

- D. Burden of proof of merit of requested substitution is the responsibility of the proposer requesting the substitution.
- E. It is the sole responsibility of the proposer requesting the substitution to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- F. When substitution is not accepted, provide specified product.
- G. Substitute products shall not be included within the bid without written acceptance by Addendum.

### **3.02 LIMITATIONS ON SUBSTITUTIONS SUBMITTED AFTER THE AWARD OF THE CONTRACT**

- A. The Contract is based upon the standards of quality established by those items of equipment and/or materials which are indicated in the Contract Documents, including those products designated as "District Standards".
- B. Architect will consider substitution requests received after the established date of the receipt of bids or contract award only when one or more of the following conditions are met and documented:
  - 1. Specified item fails to comply with regulatory requirement.
  - 2. Specified item is no longer manufactured.
  - 3. Specified item, through no fault of the Contractor, unavailable in the time frame required to meet project schedule.
  - 4. Specified item, through subsequent information disclosure, will not perform properly or fit in designated space.
  - 5. Manufacturer declares specified product to be unsuitable for use intended or refuses to warrant installation of product,
  - 6. Substitution would be, in the sole judgment of the Architect, a substantial benefit to the Owner in terms of cost, time, energy conservation, or other consideration of merit.
- C. Notwithstanding other provisions of this section and the above, the Architect may consider a request for substitution after the date of the receipt of bids or contract award, if in the sole discretion of the Architect, there appears to be just cause for such a request. The acceptance of such a late request does not waive any other specified requirement.
- D. Architect will consider a request for substitution after the date of the receipt of bids or contract award only if request is made in strict conformance with provisions of this section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in this section in the article titled PRODUCTS.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
  - 1. Review of shop drawings does not constitute acceptance of substitutions indicated or implied on shop drawings.
  - 2. Substitutions will not be considered when requested or submitted directly by subcontractor or supplier.

- F. Contractor's failure or inability to pursue the work promptly or coordinate activities properly shall not establish a cause for consideration of Substitutions.
- G. Burden of proof of merit of requested substitution is the responsibility of the Contractor.
- H. It is the sole responsibility of the Contractor to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- I. When substitution is not accepted, provide specified product.
- J. Substitute products shall not be provided without written acceptance by Change Order.

### 3.03 SUBSTITUTION PROCEDURES

- A. Document each request on Architect's Request For Substitution (RFS) form with complete data substantiating compliance of proposed substitution with Contract Documents. All requests for substitution must be submitted on the specified form which may be obtained from the Architect. Requests received without the Request Form will be rejected.
- B. A request for substitution constitutes a representation that the proposer:
  - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
  - 2. Will provide the same warranty or bonds for the substitution as for the specified product.
  - 3. Will coordinate installation of an accepted substitution and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives all claims for additional costs or time extension which may subsequently become apparent.
  - 5. Will reimburse the Owner for services provided by Owner and Architect for review or redesign services associated with re-approval by authorities.
- C. Regulatory Requirements: Proposer requesting the substitution shall be responsible for obtaining all regulatory approvals required for proposed substitutions.
  - 1. All regulatory approval shall be obtained for proposed substitutions prior to submittal of substitution request to Architect, unless Architect participation is required by the regulating agency.
  - 2. All substitutions that affect structural safety, fire and life safety, access compliance or energy (as applicable) shall be submitted to Division of State Architect for review and approval.
  - 3. All costs incurred by the Owner in obtaining regulatory approvals for proposed substitutions, including the costs of the Architect and any authority having jurisdiction over the project shall be reimbursed to the Owner. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.
- D. Substitution Submittal Procedure:
  - 1. Submit one original signature copy of only the Request For Substitution Form included in this Project Manual for consideration. Forms provided by proposer or other agencies or organizations are not acceptable. Limit each request to one proposed substitution.
  - 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence, including:
    - a. Statement of cause for substitution request.
    - b. Identify product by specification section and article number.

- c. manufacturer's name, address, and phone number.
- d. List of fabricators, suppliers, and installers as appropriate.
- e. List of similar Projects where proposed products have been used, date of installation and names of Architect and Owner.
- f. Confirmation of regulatory approvals
- g. Product data, including drawings and product samples.
- h. Fabrication and installation procedures.
- i. Comparison of the qualities of the proposed substitution with that specified.
- j. Cost data comparing the proposed substitution with the product specified.
- k. Any required license fees or royalties.
- l. Availability of maintenance service and source of replacement materials.
- m. Coordination information, including a list of changes or modifications needed to other items of work that will be required to accommodate Proposed substitution.
- n. Statement on the Substitution's effect on the Construction Schedule.
- o. Written certification by the proposer that the Substitution is equal or better in every respect to that required by the contract Documents and that substitution will perform adequately in the application intended.
- p. Written certification that the proposer will pay for all permits, fees, and costs required to implement the substitution, and including waiver of all claims for additional costs or time extension which may subsequently become apparent, and reimbursement of Owner and Architect for review or redesign services associated with re-approval by authorities.

### **3.04 ARCHITECT'S REVIEW OF SUBSTITUTIONS**

- A. The Architect will accept or reject proposed substitutions within fourteen (14) days of receipt of request.
- B. If a decision on a substitution cannot be made within the time allocated, the product specified shall be used.
- C. No extension of bid period or contract time will be made for substitution review.
- D. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of a Bid Clarification or Addendum.
- E. Final acceptance of a substitution submitted after the award of the contract will be in the form of an Architect Supplemental Instruction and/or Construction Change Direction.
- F. Architect/Engineer shall be the judge of the acceptability of the proposed substitution. Architect's decision on substitution requests is final and does not require documentation or justification.
- G. Rejection Of Substitution Request: Any of the following reasons shall be cause for rejection, all as determined by the Architect;
  1. Vagueness or incompleteness of Substitution submittal,
  2. Insufficient data, failure to meet specified requirements, (including warranty).
  3. Qualification of the requirements of the Substitution Form, including modification of any of the requirements.

- H. The Architect/Engineer will notify Contractor in writing of decision to accept, accept as noted, or not accept the request for substitution.
- I. Substitute products shall not be ordered or installed without written acceptance.
- J. Owner shall receive full benefit of any cost reduction as a result of any request for substitution.
- K. Provide submittals for accepted substitutions in accordance with specified requirements of the respective section and provisions of Section 01 2500.
  - 1. An accepted substitution is not acceptable as a submittal under Section 01 2500. Provide separate submittals for each review.

### **3.05 OWNER-SUPPLIED PRODUCTS**

- A. See Section 01 1100- Summary for identification of Owner-supplied products.
- B. Owner's Responsibilities:
  - 1. Arrange and pay for product delivery to site.
  - 2. On delivery, inspect products jointly with Contractor.
  - 3. Submit claims for transportation damage and replace damaged, defective, or deficient items.
  - 4. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
  - 1. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
  - 2. Handle, store, install and finish products.
  - 3. Repair or replace items damaged after receipt.
  - 4. Coordinate installation with other trades.

### **3.06 TRANSPORTATION AND HANDLING**

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

### **3.07 STORAGE AND PROTECTION**

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.



- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
- I. Provide bonded off-site storage and protection only when site does not permit on-site storage or protection. Obtain Owner's permission prior to initiating such off-site storage.

**END OF SECTION**

(REQUEST FOR SUBSTITUTION FORM FOLLOWS)

# Request for Substitution

**{Projects.Name}**

Project Number: {Projects.Number}  
DSA Application: {LegalDocInfo.NotaryStateOf}  
DSA File: {LegalDocInfo.NotaryName}

Specification Title: \_\_\_\_\_ Product Description: \_\_\_\_\_  
Specification Section: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Architect will consider substitution requests received after the date established as deadline for substitution request only when one or more of the following conditions are met and documented; indicate one or more conditions which apply:

- Specified item fails to comply with regulatory requirement.
  - Specified item is no longer manufactured.
  - Specified item, through no fault of the Contractor, unavailable in the time frame required to meet project schedule.
  - Specified item, through subsequent information disclosure, will not perform properly or fit in designated space.
  - Manufacturer declares specified product to be unsuitable for use intended or refuses to warrant installation of product.
  - Substitution would be a substantial benefit to the Owner in terms of cost, time, energy conservation, or other consideration of merit.
- Explain benefit (required): \_\_\_\_\_

Proposed Product Name (include specific model number): \_\_\_\_\_

Manufacturer: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

Installer: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

History:  New product  2-5 years old  5-10 years old  More than 10 years old

Difference between proposed substitution and specified product: \_\_\_\_\_

Attached comparative table. Include point-by-point comparison of each article number. **REQUIRED**

**Similar Installation:**

Project: \_\_\_\_\_ Architect: \_\_\_\_\_

Address: \_\_\_\_\_ Owner: \_\_\_\_\_

\_\_\_\_\_ Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work?  No  Yes; Explain: \_\_\_\_\_

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_).

Proposed substitution changes Contract Time?  No  Yes; [Add] or [Deduct] \_\_\_\_\_ days.

# Substitution Request

(Continued)

As outlined in Specification Section 01 6000, a request for substitution constitutes a representation that the proposer:

- Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
- Will provide the same warranty or bonds for the substitution as for the specified product.
- Will coordinate installation of an accepted substitution and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
- Waives all claims for additional costs or time extension which may subsequently become apparent.
- Will reimburse Owner for services provided by Owner and Architect associated with re-approval by authorities.

{Company.Name} Representative Printed Name: \_\_\_\_\_

{Company.Name} Representative Signature: \_\_\_\_\_

Date Submitted from {Company.Name} to Architect: \_\_\_\_\_

Supporting Data Attached:     Drawings     Product Data     Samples     Tests     Reports

Additional comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Architect's review and action:

- Substitution approved - Make submittals in accordance with Specification Section 01 3300.
- Substitution approved as noted - Make submittals in accordance with Specification Section
- 01 3300. Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

## SECTION 01 6116

### VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. VOC restrictions for product categories listed below under "DEFINITIONS."
  - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- B. All products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
  - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
  - 2. Do not use products which do not meet the requirements of this rule.

##### 1.02 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this section.
- B. Section 01 8113 "Sustainable Design Requirements".

##### 1.03 DEFINITIONS

- A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site:
  - 1. Adhesives, sealants, and sealer coatings, regardless of specification section or division.
  - 2. Paints and coatings.
  - 3. Carpet and resilient flooring.
  - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

##### 1.04 REFERENCE STANDARDS

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at [www.chps.net](http://www.chps.net).
- C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; Current Edition.

- D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; Current Edition.
- E. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at [www.greenguard.org](http://www.greenguard.org).
- F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at [www.scs-certified.com](http://www.scs-certified.com).

#### 1.05 SUBMITTALS

- A. See Section 01 3300 - Submittals Procedures.
- B. Evidence of Compliance: Submit for each different product in each applicable category.
  - 1. Identify evidence submittals with the words "CAL-Green VOC Compliance Report".
- C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- D. Installer Certifications for Accessory Materials: Require each installer of any type of product, (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.
  - 1. Use the form following this section for installer certifications.

#### 1.06 QUALITY ASSURANCE

- A. A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. General: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
  - 1. These products may be specified in multiple sections throughout these specifications.
- B. Adhesives, including carpet: Comply with Title 24, Part 11, Table 5.504.4.1.
  - 1. Evidence of Compliance: Acceptable types of evidence are:
    - a. Report of laboratory testing performed in accordance with requirements.
    - b. Published product data showing compliance with requirements.
    - c. Certification by manufacturer that product complies with requirements.
- C. Joint Sealants: Comply with Title 24, Part 11, Table 5.504.4.2.
  - 1. Evidence of Compliance: Acceptable types of evidence are:
    - a. Report of laboratory testing performed in accordance with requirements.
    - b. Published product data showing compliance with requirements.
    - c. Certification by manufacturer that product complies with requirements.

- D. Aerosol Adhesives: Comply with Title 24, Part 11, Table 5.504.4.1. and California Code of Regulations Title 17, Section 94507.
  - 1. Evidence of Compliance: Acceptable types of evidence are:
    - a. Current GreenSeal Certification.
    - b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
    - c. Published product data showing compliance with requirements.
- E. Paints and Coatings: Comply with Title 24, Part 11, Table 5.504.4.3; California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
  - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
    - a. Evidence of Compliance: Acceptable types of evidence are:
      - 1) Report of laboratory testing performed in accordance with requirements.
      - 2) Published product data showing compliance with requirements.
      - 3) Certification by manufacturer that product complies with requirements.
    - b. Provide coatings that comply with the most stringent requirements specified in the following:
      - 1) 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      - 2) South Coast Air Quality Management District Rule No.1168.
- F. Carpet: Comply with Title 24, Part 11, 5.504.4.4; meet testing and product requirements of one of the following:
  - 1. Carpet & Rug Institute "Green Label Plus".
  - 2. California Department of Public Health Standard Practice for testing of VOC's (Specification 01350).
  - 3. NSF/ANSI 140 at Gold Level.
  - 4. Scientific Certification Systems Sustainable Choice.
  - 5. All carpet cushion installed shall meet requirements of Carpet & Rug Institute "Green Label Program".
  - 6. All carpet cushion installed shall meet requirements of Title 24, Part 11, Table 5.504.4.1.
- G. Resilient Flooring Products: Comply with Title 24, Part 11, 5.504.4.6. Fifty percent of floor area receiving resilient flooring shall have flooring complying with VOC emission limits in CHPS 2009 criteria and listed on the Low Emitting Materials List or Product Registry or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.
  - 1. Provide documentation verifying that finish materials are certified to meet pollutant limits. Acceptable types of evidence are:
    - a. Published product data showing compliance with requirements.
    - b. Inclusion on one of the following lists:
      - 1) [www.chps.net/dev/drupal/node/381](http://www.chps.net/dev/drupal/node/381)
      - 2) [www.rfci.com/int\\_FS-ProdCert.htm](http://www.rfci.com/int_FS-ProdCert.htm)
      - 3) [www.greenguard.org/default.aspx?tabid=135](http://www.greenguard.org/default.aspx?tabid=135)
      - 4) Other method acceptable to enforcing agency.
- H. Composite Wood Products: Comply with Title 24, Part 11, Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products.
  - 1. Title 24, Part 11, Table 5.504.4.5 Composite Wood Products Maximum Formaldehyde Emissions in Parts per Million.

PRODUCT	CURRENT LIMIT (Effective July 1, 2012)
Hardwood Plywood veneer core	0.05
Hardwood Plywood composite core	0.05
Particleboard	0.09
Medium Density Fiberboard	0.11
Thin Medium Density Fiberboard	0.13

2. Evidence of Compliance: Acceptable types of evidence are:
  - a. Chain of custody certifications
  - b. Published product data showing compliance with requirements.
  - c. Certification by manufacturer that product complies with requirements.
  - d. Other method acceptable to enforcing agency.

### **PART 3 EXECUTION**

#### **3.01 FIELD QUALITY CONTROL**

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. All additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products will be borne by Contractor.

#### **3.02 RESTRICTED COMPONENTS**

- A. Restricted Components:
  1. Paints and coatings shall not contain any of the following:
    - a. Acrolein.
    - b. Acrylonitrile.
    - c. Antimony.
    - d. Benzene.
    - e. Butyl benzyl phthalate.
    - f. Cadmium.
    - g. Di (2-ethylhexyl) phthalate.
    - h. Di-n-butyl phthalate.
    - i. Di-n-octyl phthalate.
    - j. 1,2-dichlorobenzene.
    - k. Diethyl phthalate.
    - l. Dimethyl phthalate.
    - m. Ethylbenzene.
    - n. Formaldehyde.
    - o. Hexavalent chromium.
    - p. Isophorone.
    - q. Lead.
    - r. Mercury.
    - s. Methyl ethyl ketone.
    - t. Methyl isobutyl ketone.

- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

B. The following tables are taken from South Coast Air Quality Management District Rule No.1168 and are believed accurate at the time of publication. All products used shall comply with the limits of Rule No. 1168. In the event of discrepancy between these values and those of Rule No. 1168, those of Rule No. 1168 shall prevail.

C. **Table 5.504.4.1 ADHESIVE VOC LIMIT**

Architectural Applications	Current VOC Limit
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesives	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100
Single Ply Roof Membrane Adhesives	250

D. Table 5.504.4.1 Continued

	VOC Limits and Effective Dates **	** The specified limits remain in effect unless revised limits are listed in subsequent columns.		
Specialty Applications	Current VOC Limit	1-1-05	7-1-05	1-1-07
PVC Welding	510			
CPVC Welding	490			
ABS Welding	400		325	
Plastic Cement Welding	350	250		
Adhesive Primer for Plastic	650		550	
Computer Diskette Manufacturing	350			



Contact Adhesive	80			
Special Purpose Contact Adhesive	250			
Tire Retread	100			
Adhesive Primer for Traffic Marking Tape	150			
Structural Wood Member Adhesive	140			
Sheet Applied Rubber Lining Operations	850			
Top and Trim Adhesive	540			250

E. Table 5.504.4.1 Continued

For adhesives, adhesive bonding primers, or any other primer not regulated by the above two tables and applied to the following substrates, the following limits shall apply	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (Except Wood)	50
Wood	30
Fiberglass	80

F. Table 5.504.4.2 SEALANT VOC LIMIT

If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Nonmembrane Roof	300
Roadway	250
Single Ply Roof Membrane	450
Other	420

Sealant Primers	Current VOC Limit
-----------------	-------------------

Architectural Porous	250
Non-Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material as determined in paragraph (b)(32); for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as determined in paragraph (b)(31).	

G. Paints and Coatings: Architectural Paints and Coatings shall comply with VOC limits in Table 1 of ARB Architectural Coatings Suggested Control Measure, California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" Table 5.504.4.3. All products used in this category shall comply with these limits, unless more stringent local and regional rules apply.

H. **Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)**

Grams of VOC per Liter of Coating, less water and less exempt compounds.	
<b>COATING CATEGORY</b>	<b>Current VOC Limit 1/1/2012</b>
Flat Coatings	50
Nonflat Coatings	100
Nonflat High Gloss Coatings	150
<b>Specialty Coatings</b>	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 above)	120
Magnesite Cement Coatings	450

Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250

Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc Rich Primers	340

1. Note 1: Grams of VOC per liter of coating including water and including exempt compounds
2. Note 2: Not Applicable
3. Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

**END OF SECTION**

**SECTION 01 6116.01**

**ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM**

**1.01 FORM**

- A. Identification:
  - 1. Project Name: \_\_\_\_\_
  - 2. Project No.: \_\_\_\_\_
  - 3. Architect: \_\_\_\_\_
- B. Use of This Form:
  - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
  - 2. Contractor is required to obtain and submit this form from each installer of work on this project.
  - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
  - 4. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.
- C. VOC content restrictions are specified in Section 01 6116.

**2.01 PRODUCT CERTIFICATION**

- A. I certify that the installation work of my firm on this project:
  - 1. [HAS] [HAS NOT] required the use of any ADHESIVES.
  - 2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
  - 3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
  - 4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.
- B. Product data and MSDS sheets are attached.

**3.01 CERTIFIED BY: (Installer/Manufacturer/Supplier Firm)**

- A. Firm Name: \_\_\_\_\_
- B. Print Name: \_\_\_\_\_
- C. Signature: \_\_\_\_\_
- D. Title: \_\_\_\_\_ (officer of company)
- E. Date: \_\_\_\_\_

**END OF SECTION**

**SECTION 01 7000**

**CONTRACT CLOSEOUT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Operation and maintenance data.
- F. Spare parts and maintenance Products.
- G. Warranties and bonds.
- H. Maintenance service.

**1.02 RELATED SECTIONS**

- A. Section 01 5600 - Temporary Controls.
- B. Section 01 7500 - Starting of Systems
- C. Section 01 2900 - Applications for Payment

**1.03 CLOSEOUT PROCEDURES**

- A. Submit written certification including:
  - 1. The Work, or a designated portion thereof, is substantially complete in accordance with Contract Documents and ready for Architect/Engineer's review.
  - 2. A comprehensive list of work which is incomplete or in need of correction.
  - 3. Draft closeout submittals for the Work, or designated portions thereof.
- B. Within a reasonable time after receipt of this certification, the Architect will perform initial review. Incremental review will not be performed.
- C. If the Architect determines that the Work is not substantially complete:
  - 1. The Architect will promptly notify the Contractor and Owner in writing, setting forth reasons for the determination.
  - 2. The Contractor shall correct or complete deficiencies in the Work and send a second written certification as above.
  - 3. The Architect will perform a subsequent review as above.

- D. Coordinate corrective work under provisions of Section 01 3900 - Coordination and Meetings.
- B. Upon the Architect's determination that the Work is substantially complete, the Architect will provide to the Contractor a document co-signed by the Owner's Representative indicating remainder of work to be accomplished prior to completion of the project, or contract recognized portion thereof.

#### 1.04 FINAL INSPECTION

- A. Submit written certification that:
  - 1. Contract Documents have been reviewed,
  - 2. Work has been inspected, and that
  - 3. Work, or a designated portion thereof, is complete in accordance with Contract Documents and
  - 4. Systems and equipment have been tested in the presence of the Owner.
  - 5. Work is ready for Architect review.
- B. Within a reasonable time after receipt of this certification, the Architect will perform a review to verify the status of the Work.
- C. If the Architect determines that the Work is not substantially complete, defective or otherwise in need of correction:
  - 1. The Architect will promptly notify the Contractor and Owner in writing, setting forth reasons for the determination and listing the deficient work.
  - 2. The Contractor shall immediately correct or complete deficiencies in the Work and send a second written certification that the Work is complete.
  - 3. The Architect will perform a subsequent review as above.
  - 4. Additional review time by the Architect due to incomplete corrections may be "backcharged" to the Contractor by the Owner.
- D. When the Architect determines that the Work is complete in accordance with the Contract Documents, the Architect will request the Contractor to make closeout submittals.

#### 1.05 CLOSEOUT SUBMITTALS

- A. Submit under provisions of Section 01 3300 - Submittals.
- B. Submittals for review shall be subdivided according to design consultant review.
- C. Submittals required by governing or other authorities.
- D. Evidence of payment and release of liens under the provisions of Section 01 2900 - Applications for Payment.
- E. Certificates of insurance for products and completed operations.
- F. Record Drawings
- G. Warranties and Bonds.
- H. Operations and Maintenance information and manuals.

- I. Submit final Application for Payment identifying total adjusted Contract Price, previous payments, and sum remaining due. Adjustments include:
  1. Approved Change Orders.
  2. Unit price calculations.
  3. Allowances.
  4. Liquidated Damages.
  5. Deductions for reinspection.
  6. Deductions for deficient work uncorrected.
  7. Other adjustments.
  8. Approved payments.
  9. Contract Sum as adjusted.
  10. Amount remaining due.

#### **1.06 FINAL CLEANING**

- A. Execute final cleaning prior to Architect's initial review.
- B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned. Remove excess lubrication and other substances.
- C. All marks, stains, fingerprints, dust, dirt, splattered paint and blemishes resulting from the various operations shall be removed throughout the Project. Stair treads and risers shall be wet-mopped. Glass shall be left clean and polished both inside and outside. Clean and buff all metalwork. Plumbing fixtures and light fixtures shall be washed clean. Vacuum carpeted and soft surfaces. Exposed concrete, ceramic tile and resilient flooring shall be swept, mopped and waxed (where appropriate) in full compliance with specific requirements of finish manufacturer's specifications. Hardware and other unpainted metals shall be cleaned and all building papers and other temporary protections and labels shall be removed throughout the building, or portion of the building where Contractor was involved, all to the satisfaction of the Architect and District.
- D. Contractor shall replace filters and clean heating and ventilating equipment used for temporary heating, cooling and ventilation.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste, surplus materials and rubbish from the site.

#### **1.07 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  1. Drawings.
  2. Specifications.
  3. Addenda.
  4. Change Orders and other modifications to the Contract.
  5. Reviewed Shop Drawings, Product Data, and Samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.

- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured depths of foundations in relation to finish floor datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 4. Field changes of dimension and detail.
  - 5. Details not on original Contract drawings.
- G. Submit reproducible documents to Architect prior to final Application for Payment, including indexed PDF(s) of all required documents. Provide one PDF file each for:
  - 1. Complete Record Specifications
  - 2. Complete Record Drawings
  - 3. Complete Record Shop Drawings
- H. Receipt and acceptance of Record Documents by the Owner is a precondition for filing Notice of Completion.

#### **1.08 OPERATION AND MAINTENANCE DATA**

- A. Submit data on 8-1/2 x 11 inch (A4) text pages, bound in three-ring "slant D" binders with durable plastic covers.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project and subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on white paper, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.



- d. Operating instructions.
  - e. Maintenance instructions for equipment and systems.
  - f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  - g. Receipts for spare parts, maintenance products and keys, attested by the Owner.
3. Part 3: Project documents and certificates, including the following:
- a. Shop drawings and product data.
  - b. Air and water balance reports.
  - c. Certificates.
  - d. Originals of warranties and bonds
- E. Submit draft copy of completed volumes as an indexed PDF of all required documents. This copy will be reviewed and returned with Architect comments. Revise content of all document sets as required prior to final submission.
- F. Submit two sets of revised final volumes, within 10 days after final inspection, including indexed PDF(s) of all required documents.
- G. Receipt and acceptance of Operations and Maintenance Documents by the Owner is a precondition for filing Notice of Completion.

#### **1.09 WARRANTIES AND BONDS**

- A. Submit guarantees as specified in the General Conditions.
- B. Provide duplicate copies.
- C. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- D. Provide Table of Contents and assemble in a three ring binder with durable plastic cover. Also provide indexed PDF of scan of all warranties and bonds.
- E. Submit prior to final Application for Payment.
- F. In the case that any portion of the work is eligible for a warranty start period prior to Notice of Completion as designated by above article 1.09.F, Contractor shall conform to procedures defined by articles 1.03 through 1.09, applicable to portion of work. Upon the Architect's determination that the Work is substantially complete, the Architect will:
  1. Prepare the Certificate of Substantial Completion upon AIA Form G704 with the Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
  2. Submit the completed Certificate of Substantial Completion to the Contractor and the Owner for written acceptance of their respective duties set forth therein.
- G. For items of Work delayed beyond date of Notice of completion or Substantial Completion where applicable, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

**1.10 MAINTENANCE SERVICE**

- A. Furnish service and maintenance of components indicated in specification sections during the warranty period.
- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## SECTION 01 7419

### CONSTRUCTION WASTE MANAGEMENT

#### PART 1 GENERAL

##### 1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of each prime Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

##### 1.02 SUMMARY:

- A. Contractor shall implement procedures to divert 65% of construction waste. As many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.
- B. The Contractor shall develop a Waste Management Plan as defined in this Section and submit for review by the Owner, Construction Manager, and Architect.

##### 1.03 DEFINITIONS

- A. Waste Materials: construction materials that are excess to the contract requirements and which can not be effectively used in the Work.
- B. Salvage Materials: waste materials or materials that exist on the site that can be reused, either on site or by another entity.
- C. Recyclable Waste: waste materials that exist on site or are generated during the construction process that can be recycled/remanufactured into another material.
- D. Categories of salvageable or recyclable waste include the following:
  - 1. Concrete, Masonry, and Other Inert Fill Material: concrete, brick, rock, broken up asphalt pavement, clay, and other inert (non-organic) materials.
  - 2. Metals: metal scrap including iron, steel, copper, brass, and aluminum; includes beverage containers, packaging materials (such as metal banding), fencing, reinforcing bar, wiring, plumbing, etc.
  - 3. Untreated Wood: unpainted, untreated dimensional lumber, wood edging, wood shipping pallets, etc. Does not include pressure treated or creosote treated wood.
  - 4. Engineered Wood Products: plywood, oriented strand board, "Masonite", particleboard, manufactured trusses and beams, and glue-laminated timbers.
  - 5. Gypsum Wallboard: excess drywall construction materials including cuttings, other scrap, and excess materials.
  - 6. Cardboard: clean, corrugated cardboard such as used for packaging, etc.
  - 7. Paper Goods:
  - 8. Office paper: includes any paper, such as manufacturer instruction, specification sheets, files, correspondence, packaging, stiffeners, etc.
  - 9. Newsprint: shredded or whole newspaper goods.

10. Plastic: beverage containers, packaging materials (such as polystyrene “peanuts” and expanded polystyrene), containers (other than those used for hazardous materials), vinyl products, etc.
  11. Glass: includes glass beverage containers, and recyclable glass building materials.
  12. Insulation: rigid foam, batt, and loose fill insulation materials.
  13. Carpet: face fiber, backing, padding, and carpet cushion scrap.
  14. Paints: unused portions of paints and coatings applied on-site.
  15. Fabric: uncontaminated fabric scraps.
  16. Rubber: uncontaminated rubber scraps, including but not limited to recycled-content rubber flooring, rubber edging, tires that are no longer serviceable, etc.
  17. Other: any additional materials identified on-site to be valued for salvage, reuse, or recycling by the Contractor, Owner, Construction Manager, or Architect.
- E. Non-Recyclable Waste: All waste materials that are not able to be recycled, due to contamination, lack of recycling facilities or salvage options, or high cost.
- F. Source Separated: Materials that are separated on-site by category.
- G. Co-Mingled: Several types of construction waste that are combined in a single container. Co-mingling of recycling waste must be approved by the identified recycling facility.
- H. Hazardous Waste: Any substance whose handling and/or disposal is regulated as hazardous waste by local, state, or federal authorities.
- I. Alternative Daily Cover (ADC): Material placed over a waste collection location or container in order to prevent vector dispersal, fires, odors, or blowing debris, which is then disposed of as waste itself. ADC is not permitted on projects seeking LEED certification.

#### 1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with all applicable federal, state, and local ordinance and regulation requirements for recycling and waste management.
- B. Disposal Sites, Recyclers, and Waste Materials Processors: Use only facilities properly permitted by state and local authorities.
- C. Preconstruction Waste Management Conference: Prior to beginning work at the site, schedule and conduct a conference to review the Construction Waste Management Plan and discuss procedures, schedules and specific requirements for waste materials recycling and disposal. Discuss coordination and interface between the Contractor and other construction activities. Identify and resolve problems with compliance with requirements. Record minutes of the meeting, identifying all conclusions reached and matters requiring further resolution.
1. Plan Revision: Make any revisions to the Construction Waste Management Plan agreed upon during the meeting and incorporate resolutions agreed to be made subsequent to the meeting. Submit the revised plan to the Contracting Officer's Representative for approval.
- D. Implementation:

1. Designate an on-site party responsible for instructing workers and implementing the Construction Waste Management Plan.
2. Distribute copies of the Construction Waste Management Plan to the job site foreman and each subcontractor.
3. Include waste management and recycling in worker orientation.
4. Provide on-site instruction on appropriate separation, handling, recycling, and salvaging methods to be used by all parties at the appropriate stages of the work at the site.
5. Prominently display Waste Management Plan and clearly mark all containers and areas on site dedicated to source separation.
6. Include waste management and recycling discussion in pre-fabrication meetings with subcontractors and fabricators.
7. Also include discussion of waste management and recycling in regular job meetings and job safety meetings conducted during the course of work at the site.

#### **1.05 STORAGE AND HANDLING**

- A. Salvage Materials: Provide protective handling and storage as required for all items identified for salvage and reuse by the Owner, Construction Manager, or Architect.
- B. Recyclable Waste: Remove all recyclable materials, as identified in the Waste Management Plan, from the work location to approved containers daily. Failure to remove waste materials will be considered cause for withholding payment and/or termination of Contract.
  1. Provide separate collection containers as required by recycling haulers and to prevent contamination of materials, including protection from rain as applicable.
  2. Replace loaded containers with empty ones as demand requires but not less than weekly.
  3. If waste will be collected co-mingled in a single container for off-site sorting, facility delivery receipts must show recycling rates for each material stream.
  4. Personal waste (lunch wrappers, etc) must be collected separately from construction waste.
- E. Handling: Deposit all indicated recyclable materials in the containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition. Do not deposit contaminated materials into the containers until such time as such materials have been cleaned.
  1. If contamination chemically combines with the material so that it cannot be cleaned, do not deposit into the recycle containers.

#### **1.06 PROJECT/SITE CONDITIONS**

- A. Environmental Requirements: Transport recyclable waste materials from the Work Area to the recycle containers and carefully deposit in the containers in a manner to minimize noise and dust. Close container covers immediately after materials are deposited. Do not place recyclable waste materials on the ground adjacent to a container.
- B. Existing Conditions: Coordinate with "Instructions to Bidders" and "Supplementary Conditions".

## 1.07 SUBMITTALS

- A. Construction Waste Management Plan: Contractor must submit complete Construction Waste Management Plan for review within 30 days from the Notice to Proceed.
- B. Updated Construction Waste Management Plan with delivery receipts.

## PART 2 PRODUCTS

### 2.01 CONSTRUCTION WASTE MANAGEMENT PLAN

- A. Construction Waste Management Plan: Contractor shall develop a construction waste management plan indicating proposed methods for collection, segregation, and removal of all construction wastes and debris produced by the work of this Contract, including all costs associated with this plan. Those waste materials produced during the course of this Contract that can be recycled cost-effectively, shall be. The Waste Management Plan shall include, at a minimum, the following:
  - 1. Provide an analysis of jobsite waste to be generated, including types and quantities.
  - 2. Provide strategies for salvage, reuse, or recycling for a minimum of all materials listed below. Include additional waste materials that are deemed cost-effective to salvage, reuse, or recycle. See "Definitions" above for material categories.
  - 3. Provide documentation to justify decision not to recycle any items listed below.
  - 4. Show compliance with applicable state and local ordinances and regulations.
  - 5. Include a list of recycling facilities to which indicated recyclable materials will be distributed for disposal.
  - 6. Identify materials that are not recyclable or otherwise conservable that must be disposed of in a landfill or other means acceptable under governing State and local regulations.
  - 7. List permitted landfills and/or other disposal means to be employed.
  - 8. Indicate any instances where compliance with requirements of this Section does not appear to be possible and request resolution from the Architect.
- B. Waste Materials: The following materials shall be salvaged or recycled according to this specification. Strategies for salvage and recycling shall be identified in the Waste Management Plan as required above.
  - 1. Salvage Materials: Identify materials existing on site that are candidates for salvage and reuse, either on this Project or through sale or donation to local organizations.
  - 2. Recyclable Materials: The following materials, at a minimum, shall be salvaged or recycled. Applies to all such listed waste materials produced during the course of this Contract.
    - a. Concrete, Masonry, and Other Inert Fill Material
    - b. Metals
    - c. Untreated Wood
    - d. Gypsum Wallboard Scrap
    - e. Cardboard
    - f. Paper Goods
    - g. Beverage Containers
    - h. Plastic
    - i. Glass
    - j. Carpet

- C. Delivery Receipts: Maintain copies of delivery receipts for waste materials salvaged and sent to permitted waste materials processors or recyclers that indicate the location and name of firm accepting recyclable waste materials, types of materials, net weights of each type, date of delivery and value of materials.
- D. Maintain working copy of Construction Waste Management Plan at site for review by Owner, Construction Manager, Architect, and all Trades involved in Project.

### **PART 3 EXECUTION**

#### **3.01 WASTE MANAGEMENT**

- A. General: Implement waste management procedures in accordance with approved construction waste management plan. Maintain procedure throughout the life of this Contract.
- B. Source Separation: Separate, store, protect, and handle at the project site all identified recyclable and salvageable waste products to prevent contamination of materials and maximize recyclability and salvageability of materials.
- C. Collection: Arrange for timely pickups from the site or deliveries to approved recycling facilities of designated waste materials to keep construction site clear and prevent contamination of recyclable materials. Maintain records accessible to the Contracting Officer's Representative for verification of construction waste materials recycling.
- D. Delivery Receipts: Keep and maintain records of all deliveries to recycling facilities and all pickups of waste materials at the site by others as specified above.
- E. Salvage and Reuse: Identify salvage and reuse options for all materials that are deemed to be reusable, but will not be reused on this Project.
- F. Non-Recyclable Waste: Collect and segregate non-recyclable waste for delivery to a permitted landfill site.
- G. Hazardous Waste: Control and dispose of hazardous waste in accordance with local, state, and federal regulations.

**END OF SECTION**

## SECTION 01 7500

### STARTING OF SYSTEMS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Starting of Systems:
  - 1. New systems in this Contract.
  - 2. Existing systems relocated or disturbed by the Work of this Contract.
- B. Demonstration and instructions.
- C. Testing, adjusting, and balancing.

##### 1.02 RELATED SECTIONS

- A. Section 01 4000 - Quality Control: Manufacturers field reports.
- B. Section 01 7000 - Contract Closeout: System operation and maintenance data and extra materials.

##### 1.03 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractors' personnel in accordance with manufacturers' instructions.
- G. Submit a written report in accordance with Section 01 3300 - Submittals that equipment or system has been properly installed and is functioning correctly.

##### 1.04 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion, including existing telephone, intercom and fire alarm.



- B. Demonstrate Project equipment by a qualified manufacturers' representative who is knowledgeable about the Project.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within four months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at designated location.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## SECTION 01 7513

### EXECUTION REQUIREMENTS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Execution and installation requirements.
- B. Products and installation for patching and extending work.
- C. Transition and adjustments.
- D. Repair of damaged surfaces, finishes, and cleaning.
- E. Existing Systems: Relocation and restoration of function, testing.

##### 1.02 RELATED SECTIONS

- A. Section 01 2500 - Submittals: Submittals procedures.
- B. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
- C. Section 01 5000 - Temporary Facilities and Section 015600 - Temporary Controls: Exterior enclosures, temporary heating/cooling/ventilating facilities.
- D. Section 01 7000 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

##### 1.03 SUBMITTALS

- A. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
  - 1. On request, submit documentation verifying accuracy of survey work.
  - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
  - 3. Submit surveys and survey logs as for the project record.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration which affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of Owner or separate Contractor.

##### 1.04 QUALIFICATIONS

- A. For survey work employ a land surveyor registered in California and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

#### 1.05 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- E. Erosion and Sediment Control: Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- F. Noise Control: Provide methods, means, and facilities to minimize noise from demolition, earthwork and noise produced by construction operations.
- G. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

#### 1.06 COORDINATION

- A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate occupancy requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

- D. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## **PART 2 PRODUCTS**

### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000.

### **2.02 FABRICATION**

- A. Machine-roll components or elements required to be curved or radiused. Do not field bend or "walk-down". Provide true curves minimizing joints, segmented fabrication not allowed.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance of existing conditions.
- B. Verify that demolition is complete in alterations areas and areas are ready for installation of new work.
- C. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- D. Examine and verify specific conditions described in individual specification sections.

- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### **3.02 PREPARATION**

- A. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ducts and piping to prevent condensation in exposed areas.
- E. Prepare surfaces and remove surface finishes to provide for proper installation of new work and finishes.
- F. Clean substrate surfaces prior to applying next material or substance.
- G. Seal cracks or openings of substrate prior to applying next material or substance.
- H. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### **3.03 LAYING OUT THE WORK**

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that indicated on Drawings.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

- H. Utilize recognized engineering survey practices.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
  - 2. Grid or axis for structures.
  - 3. Building foundation, column locations, ground floor elevations.
  - 4. All other work as indicated or necessary.
- J. Periodically verify layouts by same means.
- K. Maintain a complete and accurate log of control and survey work as it progresses.

### **3.04 GENERAL INSTALLATION REQUIREMENTS**

- A. Install Products as specified in individual sections.
- B. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new Work abuts or aligns with existing, perform a smooth and even transition.
- C. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
- D. Grind or bush split-faced or textured masonry to achieve hairline fit to adjacent trim, flashings, inserts, escutcheons or other penetrating elements.
- E. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- F. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
- G. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.
- H. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- I. Re-cover and refinish work that exposes mechanical and electrical work exposed accidentally during the work.

### **3.05 CUTTING AND PATCHING**

- A. Execute cutting and patching including excavation and fill to complete the work, to uncover work to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit Products together to integrate with other work.

- B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- E. Restore work with new Products in accordance with requirements of Contract Documents.
- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07840, to full thickness of the penetrated element.
- H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- I. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

### **3.06 PROGRESS CLEANING**

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site periodically and dispose off-site.

### **3.07 PROTECTION OF INSTALLED WORK**

- A. Protect installed work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

### **3.08 ADJUSTING**

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Division 23 and Sections 01 4000 and 01 7500.

### **3.09 EXISTING SYSTEMS**

- A. Examine and test existing building systems and utilities with components requiring relocation during performance of this work. Examples may include but are not limited to:
  - 1. Mechanical Systems
  - 2. Plumbing Systems
  - 3. Electrical Systems, line voltage, low voltage, signal alarm, or data.
  - 4. Fiber-optic data or communication cabling systems.
- B. Remove or relocate these components while work is performed.
  - 1. Fiber-optic data cabling systems are extremely fragile and subject to mechanical damage. Relocate these systems with great care. Do not disconnect or remove these systems, which must remain in place and in operation during the Work.
- C. Restore these components to the former location upon completion of the Work.
- D. Test systems under provisions of Section 01 7500 to confirm proper operation. Conduct tests in the presence of the Architect and Owner's Representative.
- E. Perform remedial work as necessary to establish proper operation. Assume responsibility for proper operation of systems following completion of Work.

**END OF SECTION**



## SECTION 01 8113

### SUSTAINABLE DESIGN REQUIREMENTS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
  - 1. Chapter 5- Non-Residential Mandatory Measures.

##### 1.02 RELATED REQUIREMENTS

- A. Pertinent sections specifying erosion control.
- B. Section 01 6116 - Volatile Organic Compound (VOC) Restrictions.
- C. Section 01 7419 - Construction Waste Management and Disposal.
- D. Section 01 7000 - Contract Closeout.
- E. Pertinent sections specifying landscape irrigation.

##### 1.03 DEFINITIONS

- A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the Code. Words and terms used in this section shall have the meanings shown therein.

##### 1.04 INFORMATIONAL SUBMITTALS

- A. General: Submit CAL-GREEN submittals required by code and in other Specification Sections.
- B. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
- C. Acceptable verification submittals are specified in the related sections.

#### PART 2 PRODUCTS

##### 2.01 REQUIREMENTS - GENERAL

- A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

##### 2.02 STORM WATER POLLUTION PREVENTION PLAN

- A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

##### 2.03 OUTDOOR WATER USE

- A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

**2.04 CONSTRUCTION WASTE REDUCTION**

- A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

**2.05 BUILDING MAINTENANCE AND OPERATION**

- A. Section 5.410.2.3, 4. Commissioning and Functional Performance Testing: Participate in Commissioning and provide functional performance testing as required by these code sections and as specified in Section 01 7500.
- B. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7500 and Systems Manual as specified in Section 01 7500.

**2.06 POLLUTANT CONTROL**

- A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances.
  - 1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.
- B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

**PART 3 EXECUTION**

**3.01 GENERAL**

- A. Comply with Section 01 7419 - Construction Waste Management and Disposal.
- B. Comply with execution requirements of related sections and applicable local codes and ordinances.

**END OF SECTION**

**SECTION 02 4119**  
**MINOR DEMOLITION FOR REMODELING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Remove existing work as indicated and as necessary to permit new work.
  - 1. Removal of designated building equipment and fixtures.
  - 2. Removal of designated construction.
- B. Disposal of materials.
- C. Identification of utilities.
- D. Salvaging, storing, and protecting existing work to remain or to be removed and re-installed.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1100 - Summary: Work sequence and continued occupancy of the building.
- B. Section 01 5000 - Temporary Facilities and Controls: Temporary enclosures, dust control barricades, security at occupied areas, and cleanup during construction.
- C. Section 01 7419 - Construction Waste Management.
- D. Section 01 7513 - Execution Requirements: Re-installation of removed components.

**1.03 REFERENCE STANDARDS**

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- B. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code, "CAL-Green".

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Project Record Documents: Accurately record actual locations of capped utilities.

**1.05 REGULATORY REQUIREMENTS**

- A. Conform to Title 24, CBC code for demolition work, dust control, products requiring electrical disconnection and re-connection .
- B. Do not close or obstruct egress from any building exit or site exit.
- C. Do not disable or disrupt building fire or life safety systems without 10 (ten) days prior written notice to Owner.
- D. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.

**1.06 SEQUENCING**

- A. Sequence work under the provisions of Section 01 1100.

**1.07 SCHEDULING**

- A. Schedule work under the provisions of Section 01 3200.

- B. Schedule work to coincide with new construction.
- C. Coordinate demolition with other trades to assure the proper sequence, limits, methods and time of performance. Schedule work so as to impose a minimum of hardship on the present operation of facilities and the performance of the work of other trades or contracts.
- D. Describe demolition and removal procedures in the Project schedule.
- E. Perform noisy, malodorous, or dusty work during hours described below. Conform to more stringent requirements of local authorities having jurisdiction, when applicable:
  - 1. Between the hours of 7:00 am and 5:00 pm.

#### **1.08 PROJECT CONDITIONS**

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Use all means necessary to protect existing objects, construction and plantings designated to remain. In the event of damage, make all repairs and replacements necessary for approval of Architect at no additional cost to the Owner.
- C. Protective measures: Provide all necessary safeguards, including warning signs and lights, barricades, and the like, for protection of the public, Contractor's employees and existing improvements during demolition. Prevent access of unauthorized persons to area of work
- D. Provide at least one person who shall be present at all times during execution of this portion of the work, be thoroughly familiar with the type of work being performed and the best methods for its execution and who shall direct all work performed under this Section.
- E. Control the use of water to prevent damage to the existing facilities to remain. Provide wet vacuum equipment where water, such as waste cooling water from concrete sawing or water used as dust emollient, is used adjacent to and in existing buildings.
- F. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Provide, erect, and maintain temporary barriers at locations indicated.
- B. Inspect the area of work and verify locations of all items designated to be removed or preserved.
- C. Do not begin demolition work until temporary barricades, warning signs and other forms of protection are installed.
- D. Erect and maintain weatherproof closures for exterior openings.
- E. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued occupancy of adjacent buildings.
- F. Protect existing materials and features that are not to be demolished.
- G. Prevent movement of structure; provide bracing and shoring.

1. Be responsible for the adequacy and design of all temporary shoring and bracing systems.
- H. Notify affected utility companies before starting work and comply with their requirements.
- I. Mark location and termination of utilities.
- J. Provide appropriate temporary signage including signage for exit or building egress.

### 3.02 DEMOLITION

- A. Disconnect, remove, and identify designated utilities within demolition areas.
- B. Demolish in an orderly and careful manner. Protect existing supporting structural members and features indicated to remain.
  1. Cut openings in existing walls or roofs at locations necessary to accommodate new doors, windows, ductwork, piping, conduits, raceways or other building services or elements.
  2. Demolish concrete curbs at locations of walls to be removed.
  3. Remove dry-rotted wood materials and other unsuitable materials as indicated and as required to provide sound substrates for other work.
  4. Use of explosives will not be permitted.
- C. Remove existing flooring, wall coverings, trim or other finishes in areas designated to receive new work.
- D. Remove existing construction only to the extent necessary for the proper installation of new construction and junction with existing work. Cut back finished surfaces to straight, plumb or level lines as required.
- E. Mechanical, Plumbing and Electrical systems : Demolish existing improvements as required to permit installation of new systems indicated. Refer to pertinent sections of Divisions 22, 23 and 26 for additional specific demolition required for mechanical, plumbing and electrical systems.
- F. Securely seal exposed ends of existing ductwork systems left open by demolition operations. Prevent entry of foreign matter. Protect these seals from damage until connected to new work.
- G. Remove all fasteners, anchors, supports and similar appurtenances from substrates indicated to remain. Leave substrates in good condition to receive new work.
  1. Pull nails from wood framing. Unthread screws, do not pull out. Do not drive existing nails or screws flush.
  2. Remove suspended ceiling support wires.
  3. Remove staples, screws, and miscellaneous anchors from all gypsum board, wood paneling, masonry wall surfaces indicated to remain.
- H. Demolish as follows:
  1. Portland cement concrete, asphalt concrete paving: Saw cut or core drill; jack-hammering of central areas away from saw-cut joint is acceptable for removing large areas of concrete. Cut back concrete or paving to clean, straight saw-cut lines. Provide wet vacuum equipment as required for control of waste cooling water.
  2. Modular materials such as ceiling, resilient and ceramic tile: Remove to a natural point of division in whole units to a joint line with no damaged or defective unit remaining to adjoin new construction.
  3. Gypsum wallboard: Remove to a joint line on a support.
  4. Wood trim: Remove to a natural existing joint line.

- I. Examine substrates and surfaces exposed by demolition for water damage, dryrot, decay, termite infestation or other structural failure. Request direction from the Architect if these conditions are discovered. Additional demolition beyond scope originally indicated may be required to fully remove damaged or unsuitable materials.
- J. Work not mentioned to be removed that interferes with new construction shall be cut to clean cut lines to provide for proper interface with new construction, or patching and repair, as required.
- K. All holes or trenches created by removal of underground piping or other facilities demolished shall be filled with clean soil and compacted to the density for fills specified. Do not backfill if subsequent excavation will occur at the same location. Do not backfill hole or trenches until inspected by the Soils Engineer or IOR.
- L. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- M. Remove materials as demolition progresses. Upon completion of demolition, leave areas in clean condition.
- N. Remove temporary facilities.

### **3.03 SALVAGE**

- A. Items indicated to be salvaged shall be removed carefully, cleaned and stored in a protected location on or off the site until re installed; salvaged items to be delivered to the Owner shall also be removed carefully and presented to the Owner's designated representative.
- B. Owner may take possession of any items of salvage for his use if he desires. Provide incidental labor to relocate designated salvage for Owner's storage.

### **3.04 PATCHING**

- A. Patch materials to remain when damaged by this work. Finish materials and appearance of the patch or repair work shall match the existing contiguous materials and finishes in all respects and shall be approved by Architect.
- B. Where openings are cut oversize or in improper location, replace the excess removed material as instructed by Architect at no additional cost to the Owner.

### **3.05 CLEAN-UP AND DISPOSAL**

- A. Debris, waste, and removed materials, other than items to be salvaged, are Contractor's property for legal disposal off the site, as required by applicable Federal and State regulations. Continuously clean up and remove these items. Do not allow demolished items to accumulate. All materials to be disposed, shall meet the requirements of the Construction Waste Management program.
- B. Leave the site in a neat and orderly condition prepared for the work of other trades.

### **3.06 SCHEDULES**

**END OF SECTION**

## SECTION 03 1000

### CONCRETE FORMING AND ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Section Includes: All labor, materials and equipment and all operations required to complete all formwork as indicated on the drawings; to produce shapes and configurations as shown, as required; and as specified herein, including:
  - 1. Forms, shores, bracing, removal and other operations as necessary for all cast-in-place concrete placed.
  - 2. Setting and securing anchor bolts and other metal items embedded in concrete into formwork, using materials and layouts furnished and delivered to jobsite as specified under other sections.
- B. Related Sections:
  - 1. Pertinent Sections of Division 03 specifying concrete construction.
  - 2. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete foundations and formwork.

##### 1.02 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 19A Concrete.
- B. American Concrete Institute (ACI) PRC-347 "Guide to Formwork for Concrete".
- C. American Plywood Association (APA) "Concrete Forming Guide".
- D. West Coast Lumberman Inspection Bureau (WCLIB) "Standard Grading Rules for West Coast Lumber".
- E. ACI MNL-066 "ACI Detailing Manual".
- F. ACI SPEC-301 "Specifications for Concrete Construction".
- G. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

##### 1.03 DESIGN REQUIREMENTS

- A. Design, engineer, and construct formwork, shoring and bracing to conform to design and code requirements, resist imposed loads; resultant concrete to conform to required shape, line and dimension.

##### 1.04 SUBMITTALS

- A. Limitation of review: Structural Engineer's review will be required only where specifically requested for general architectural applications and features only. Contractor is responsible for structural stability, load-resisting characteristics and sufficiency of form work design.

## 1.05 QUALITY ASSURANCE

- A. General: All form materials shall be new at start of work. Produce high quality concrete construction. Minimize defects due to joints, deflection of forms, roughness of forms, nonconforming materials, concrete or workmanship.
- B. Reuse of Forms: Plywood forms may be reused, if thoroughly cleaned of all dirt, mortar, and foreign materials, and undamaged at edges and contact face. Reuse shall be subject to permission from the Architect without exception, and issued in writing. Reuse of any panel which will produce a blemish on exposed concrete, will not be permitted.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Form Materials:
  - 1. Non-Exposed Surface Formwork Facing: Forms for concrete which is not exposed to view, may be of plywood as specified for exposed surfaces, or square edge 1x nominal Douglas Fir, Construction Grade, S4S.
  - 2. Exposed Surface Formwork Facing:
    - a. Forms for all exterior and interior concrete flat surfaces unless otherwise specified as board formed shall be new Douglas Fir Plywood (APA) ply, 5/8-inch, B-B Plyform, Class 1, Exterior Type, oiled and edged and edge-sealed conforming to U.S. Product Standard PS 1 in large sheet sizes to achieve joint patterns shown.
    - b. All exposed concrete edges shall be chamfered 3/4" minimum or as noted on the drawings.
- B. Earth Forms: Allowed, subject to soil standing in excavations without ravel or caving.
- C. Form Release Agent: Spray-on compound, not affecting color, bond or subsequent treatment of concrete surfaces. Maximum VOC content shall comply with local requirements and California Green Building Code.
- D. Accessories: Types recommended by manufacturers or referenced standards to suit conditions indicated;
  - 1. Anchors, spacers, void in-fill materials: sized to resist imposed loads.
  - 2. Form Ties: Prefabricated rod, flat band, or wire snap ties with 1" break-back or threaded internal disconnecting type with external holding devices of adequate bearing area. Ties shall permit tightening and spreading of forms and leave no metal closer than 1" to surface.
- E. Corner Chamfers and Rustications: Filleted, wood strip or foam type; sizes and shapes as detailed, or 3/4 x 3/4 inch size minimum if not detailed; maximum possible lengths.
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.



### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Inspect the substrate and the conditions under which concrete formwork is to be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and conditions.
- B. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

#### **3.02 EARTH FORMS**

- A. If natural soil or compacted fill can be accurately cut and maintained, foundations and grade beams may be poured against earth without forming. Provide positive protection of trench top corners.
- B. Maintain earth forms free of water and foreign materials.

#### **3.03 ERECTION - FORMWORK**

- A. General: Construct formwork in accordance with calculations, and recommendations of ACI PRC-347. Construct forms to the sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in finished structure. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required. Use selected materials to obtain required finishes.
  - 1. Construct cambers specified in concrete members and slabs in the formwork.
  - 2. Schedule the work and notify other trades in ample time so that provisions for their work in the formwork can be made without delaying progress of the project. Install all sleeves, pipes, etc. for building services systems, or other work. Secure information about and provide for all openings, offsets, recessed nailing blocks, channel chases, anchors, ties, inserts, etc. in the formwork before concrete placement.
  - 3. Deflection: Formwork and concrete with excessive deflection after concrete placement will be rejected. Excessive deflection is that which will produce visible and noticeable waves in the finished concrete.
- B. Formwork Construction: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301. Uniform, substantial and sufficiently tight to prevent leakage of concrete paste, readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials. Tie, brace, shore, and support to insure stability against pressures from any source, without failure of any component part and without excessive deflection. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.
- C. Provide all openings, offsets, inserts, anchorages, blocking, and other features of the work as shown or required. See INSERTS, EMBEDDED PARTS, AND OPENINGS for detailed requirements.

- D. Warped, checked, or scuffed forms will be rejected.
- E. Maintain membranes, reinforcing and other work free of damage; protect with plywood runway boards or other positive, durable means.
- F. Align joints and make watertight. Keep form joints to a minimum.
- G. Provide fillet and chamfer strips on external corners of exposed locations and as indicated to form patterns in finished work. Extend patterns around corners and into alcoves, on backs of columns and similar locations not otherwise shown.
  - 1. Produce beveled, smooth, solid, unbroken lines, except as otherwise indicated to conform to patterns.
  - 2. Form corners and chamfers with 3/4 inch x 3/4 inch strips, unless otherwise indicated, accurately formed and surfaced to produce uniformly straight lines and tight edge joints. Extend terminal edges to required limit and miter chamfer at changes in direction.
- H. Unexposed corners may be formed either square or chamfered.
- I. Ties and Spreaders: Arrange in a pattern acceptable to the Architect when exposed. Snap-ties may be used except at joints between pours where threaded internal disconnecting type shall be used.
- J. Coordinate this section with other sections of work that require attachment of components to formwork.
- K. Reglets and Rebates: Accurately locate, size, and form all reglets and rebates required to receive work of other trades, including flashing, frames, and equipment.

### **3.04 APPLICATION - FORM RELEASE AGENT**

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not allow excess form coating material to accumulate in the forms or to come into contact with reinforcement or surfaces which will be bonded to fresh concrete.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork will be rejected.
- E. Leave no residue or stain on the face of the concrete, nor affect bonding of subsequent finishes or work specified in other sections.

### **3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS**

- A. Provide formed openings where required for items to be embedded in passing through concrete work.

1. Provide openings in concrete formwork to accommodate work of other sections including those under separate contracts (if any). Size and location of openings, recesses and chases shall be in accordance with the section requiring such items. Accurately place and securely support items to be built into forms.
- B. Construction Joints: Construct and locate generally as indicated on Drawings and only at locations approved by Structural Engineer, so as not to impair the strength of the structure. Form keys in all cold joints shown or required.
- C. Locate and set in place items that will be cast directly into concrete.
- D. Rough Hardware and Miscellaneous Metal: Set inserts, sleeves, bolts, anchors, angles, and other items to be embedded in concrete. Set embedded bolts and sleeves for equipment to template and approved shop drawings prepared by trades supplying equipment.
- E. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- F. Wood Inserts and Nailers: Provide approved preservative-treated lumber. Set all required nailing blocks, grounds, and other inserts as required to produce results shown. Wood plugs shall not be used.
- G. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- H. Piping: Do not embed piping in structural concrete unless locations specifically approved by Structural Engineer.
- I. Conduit: Place conduit below slabs-on-grade and only as specifically detailed on structural drawings. Minimum clear distance between conduits shall be 3 diameters. Location shall be subject to Engineer's written approval and shall not impair the strength of the structure.
- J. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
  1. Provide openings for the introduction of vibrators at intervals necessary for proper placement.
  2. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

### **3.06 FORM CLEANING**

- A. Clean forms as erection proceeds, remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
  1. Remove all dirt, chips, sawdust, rubbish, water and foreign materials detrimental to concrete.
  2. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

### **3.07 FOOTINGS**

- A. Verify elevations and provide final excavation required for footings prior to placing of concrete.

### **3.08 EQUIPMENT BASES**

- A. Form concrete bases for all mechanical and electrical equipment in accordance with approved shop details furnished by other sections.
- B. Sizes and locations as indicated and as required to produce results shown.
- C. Provide coved base for all equipment bases placed on concrete slabs.

### **3.09 SUPPORT STAKES**

- A. Where required to support formwork, steel stakes located within the concrete placement area shall be sleeved with PVC pipe of as small of size practical to fit the stake. Sleeves shall be filled with grout after removal of stake. Such stakes shall be located no closer than 48 inches on center each way.
- B. Wood stakes shall not be used within the area of concrete placement.

### **3.10 FORMWORK TOLERANCES**

- A. Construct formwork to maintain tolerances required by ACI SPEC-301.

### **3.11 FIELD QUALITY CONTROL**

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- B. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.
- C. Clean and repair surfaces to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.
- D. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets.

### **3.12 FORM REMOVAL**

- A. Do not loosen or remove forms before minimum curing period has elapsed without employment of appropriate alternate curing methods, approved by the Architect in writing.
- B. Remove forms without damage to the concrete using means to insure complete safety of the structure and without damage to exposed beams, columns, wall edges, chamfers and inserts. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

- C. Do not remove forms until the concrete has hardened sufficiently to permit safe removal and the concrete has attained sufficient strength to safely support imposed loads. The minimum elapsed time for removal of forms after concrete has been placed shall be as follows:
  - 1. Slabs: 7 days minimum.
- D. Durations listed above are minimums and are subject to extension at the sole judgment of the Architect/Engineer.
- E. Do not subject concrete to superimposed loads (structure or construction) until it has attained full specified design strength, nor for a period of at least 14 days after placing.
- F. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

### **3.13 CLEANING**

- A. Remove excess material and debris associated with this work from the job site.

**END OF SECTION**

## SECTION 03 2000

### CONCRETE REINFORCING

#### PART 1 GENERAL

##### 1.01 SUMMARY

A. Section Includes:

1. Reinforcing steel work for all concrete work as indicated on the drawings and specified herein.
2. Coordinate this work with other work affected by these operations, such as forms, electrical work, mechanical work, and concrete.

B. Related Sections:

1. Pertinent Sections of Division 01 specifying Quality Control and Testing Laboratory services.
2. Pertinent Sections of Divisions 03 specifying concrete construction.
3. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete work.

##### 1.02 REFERENCE STANDARDS

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC) Chapter 19A Concrete.
- B. American Concrete Institute (ACI) SPEC-301 "Specifications for Concrete Construction".
- C. ACI CODE-318 "Building Code Requirements for Structural Concrete and Commentary".
- D. ACI MNL-066 "ACI Detailing Manual".
- E. ASTM A615 "Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement".
- F. ASTM A706 "Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement".
- G. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

##### 1.03 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. Submit for review prior to fabrication.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer.

- C. Shop Drawings: Show complete fabrication and placing details of all reinforcing steel. Comply with requirements of ACI MNL-66. Include:
  - 1. Bar sizes and schedules;
  - 2. Shapes of bent bars, layout and spacing of bars, location of splices.
  - 3. Stirrup spacing, arrangements and assemblies,
  - 4. References to Contract Document detail numbers and designations.
- D. Product Data: Submit manufacturer's product data, specifications, location and installation instructions for proprietary materials and reinforcement accessories. Provide samples of these items upon request.
- E. Certificates: Submit all certifications of physical and chemical properties of steel for each heat number as manufactured, including location of material in structure as specified below in Article titled QUALITY ASSURANCE. All materials supplied shall be tagged with heat numbers matching submitted Mill Test Report analyses.
- F. Samples: Provide to the Owner's Testing laboratory as specified in Article SOURCE QUALITY CONTROL.

#### **1.04 QUALITY ASSURANCE**

- A. Perform work of this Section in accordance with CRSI DA4, CRSI P1, ACI SPEC-301, and ACI CODE-318.
- B. Requirements of Regulatory Agencies, refer to pertinent Sections of Division 01 and CBC.
- C. Certification and Identification of Materials and Uses: Provide Owner's Testing Agency with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection and all material identification/ test information listed below.
  - 1. Provide manufacturer's Mill Test Reports for all materials. Include chemical and physical properties of the material for each heat number manufactured. Tag all fabricated materials with heat number.
  - 2. Provide letter certifying all materials supplied are from heat numbers covered by supplied mill certificates. Include in letter the physical location of each grade of reinforcing and/or heat number in the project (i.e. foundations, walls, etc.).
  - 3. Unidentified Material Tests: Where identification of materials by heat number to mill tests cannot be made, Owner's Testing Agency shall test unidentified materials as described below.
- D. Testing and Inspection: Tests and Inspections required by Independent Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and test reports in conformance with pertinent Sections of Division 01.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Comply with pertinent requirements of Division 01.

- B. Deliver reinforcement to project site in bundles marked with durable tags indicating heat number, mill, bar size and length, proposed location in the structure and other information corresponding with markings shown on placement diagrams.
- C. Handle and store materials above ground to prevent damage, contamination or accumulation of dirt or rust.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Reinforcing Steel: Deformed billet steel bars, ASTM A706 Grade 60 or ASTM A615 Grade 60.
  - 1. All reinforcement to be unfinished.
- B. Tie Wire: No. 16 AWG or heavier, black annealed.
- C. Concrete Blocks: On-grade conditions only, as required to support reinforcing bars in position.

### **2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4), unless specifically shown otherwise. Details not specifically shown or indicated shall conform to SP-066 and specified codes and standards.
  - 1. Accurately shop-fabricate to shapes, bends, sizes, gauges and lengths indicated or otherwise required.
  - 2. Bend bars once only. Discard bars improperly bent due to fabricating or other errors and provide new material; do not re-bend or straighten unless specifically indicated. Rebending of reinforcement in the field is not allowed.
  - 3. Do not bend reinforcement in a manner that will injure or weaken the material or the embedding concrete.
  - 4. Do not heat reinforcement for bending. Heat-bent materials will be rejected.
- B. Unacceptable materials: Reinforcement with any of the following defects will not be permitted in the work.
  - 1. Bar lengths, depths and bends exceeding specified fabrication tolerances.
  - 2. Bends or kinks not indicated on Drawings or final shop drawings.
  - 3. Bars with reduced cross-section due to rusting or other cause.
- C. Tag reinforcement with durable identification to facilitate sorting and placing.
- D. Shop Fusion Welded Stirrup/Tie/Spiral Cages
  - 1. Shop fusion welding of stirrup/tie/spiral cages is permitted to aid in fabrication and handling. The following requirements shall be met.
  - 2. All reinforcing bars receiving weld shall be ASTM A706.
  - 3. Longitudinal holding wires shall be ASTM A1064.
  - 4. Shop welding shall be performed by machines under a continuous, controlled process.



5. Quality control tests shall be performed on shop-welded specimens and the test results shall be available, upon request, to the Architect/Engineer.
6. Tack welding of reinforcing steel is not permitted.
7. Welding of any type shall not occur at 90°, 135°, or 180° bends. Circular ties and spirals may be shop fusion welded outside of areas with 90°, 135°, or 180° hook bends.
8. Longitudinal bars shall not be welded to stirrups/ties/spirals.

### **2.03 SOURCE QUALITY CONTROL**

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform the following:
  1. Sampling and Tests of Reinforcing Bars per CBC 1910A.2.
  2. Material Testing:
    - a. Identified Steel: When samples are taken from bundled steel identified by heat number, matched with accompanying mill analyses as delivered from the mill, Owner's Testing Agency will perform one tensile test and one bend test per each ten tons or fraction thereof for each required size of reinforcing steel.
    - b. Unidentified Steel: When identification of materials by heat number matched to accompanying mill analyses cannot be made, perform one tensile test and one bend test per each two and one-half tons or fraction thereof for each required size of reinforcing steel. Tests of unidentified steel shall be performed by the Owner's Testing Agency and costs for these tests shall be paid by the Contractor by deductive change order.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Inspect the conditions under which concrete reinforcement is to be placed. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Coordinate with work of other sections to avoid conflicts or interference. Bring conflicts between reinforcement and other elements to Architect's attention. Resolve conflicts before concrete is placed.
- C. Notify Architect, Structural Engineer, and Authority Having Jurisdiction for review of steel placement not less than 48 hours before placing concrete.

### **3.02 PLACEMENT**

- A. General: Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean bars free of substances which are detrimental to bonding. Maintain reinforcement clean until embedded in concrete.
- C. Place reinforcement to obtain the minimum coverages for concrete protection. Do not deviate from required position. Maintain required distance, spacing and clearance between bars, forms, and ground.

- D. Location and Support: Provide metal chairs, runners, bolsters, spacers and hangers, as required.
- E. Provide additional steel reinforcement as necessary or as directed, to act as spreaders or separators to maintain proper positioning.
- F. Tying and Attachment: Securely tie at all intersections and supports with wire. Prevent dislocation or movement during placement of concrete. Direct twisted ends of wire ties away from exposed concrete surfaces.
- G. Separate reinforcing from pipes or conduits with approved non-metallic separators. Do not use wood or steel form stakes or reinforcement used as stakes as support for reinforcement.
- H. Accommodate placement of formed openings required by other sections.
- I. Obstructions:
  - 1. Where obstructions, block-outs, or penetrations (conduits, raceways, ductwork) prevent continuous placement of reinforcement as indicated, provide additional reinforcing as detailed and as directed by the Structural Engineer to supplement the indicated reinforcement around the obstruction.
  - 2. Place additional trim bars, ties, stirrups, or other elements as detailed and as directed at all opening, sleeves, pipes or other penetrations through structural elements.

### **3.03 REINFORCING SPACING AND COVERAGE**

- A. Spacing: Do not space bars closer than four (4) diameters of the largest of two adjacent bars, except at bar laps, which shall be placed such that a minimum of 2 bar diameters is clear between bars.
- B. Where reinforcing in members is placed in two layers, the distance between layers shall not be less than four bar diameters of the largest bar and the bars in the upper layers shall be placed directly above those in the bottom layer, unless otherwise detailed or dimensioned.
- C. Coverage of bars (including stirrups and columns ties) shall be as follows, unless otherwise shown:
  - 1. Slabs (on grade): 2 inches to grade face, 1-1/2 inches to top face.

### **3.04 DOWELS, SPLICES, OFFSETS AND BENDS**

- A. Provide standard reinforcement splices at splices, corners, and intersections by lapping ends, placing bars in contact, and tightly tying with wire at each end. Comply with details shown on structural drawings and requirements of ACI CODE-318.
- B. Provide minimum 1-1/2 inch clearance between sets of splices. Stagger splices in horizontal bars so that adjacent splices will be 4 feet apart.
- C. Splices of reinforcement shall not be made at points of maximum stress. Provide splice lengths as noted on the structural drawings, with sufficient lap to transfer the stress between bars by bond and shear.

D. Spacing:

1. Space bars minimum distance specified and all lapped bars 2 bar diameters (minimum) clear of the next bar.
2. Stagger splices of adjacent bars where possible and where required to maintain bar clearance.
3. Request Architect/Engineer review prior to placement for all splices not shown on the drawings.

**3.05 MISPLACED REINFORCEMENT**

- A. Notify Architect/Engineer immediately if reinforcing bars are known to be misplaced after concrete has been placed.
- B. Perform no correction or cutting without specific direction. Do not bend or kink misplaced bars.
- C. Correct misplaced reinforcing only as directed in writing by the Architect/Engineer. Bear all costs of redesign, new, or additional reinforcing required because of misplaced bars at Contractor's expense.

**3.06 FIELD QUALITY CONTROL**

- A. The Testing Agency as specified in the Article QUALITY ASSURANCE, will inspect the work for conformance to contract documents before concrete placement.
  1. Inspection: Provide inspection and verification of installed reinforcement. Confirm that the surface of the rebar is free of form release oil or other coatings.
  2. Inspect all preheat and welding activities for steel reinforcement, when these occur.
  3. Exception: Non-structural patios, driveways, and sidewalks do not require special inspection.

**3.07 CLEANING**

- A. Remove excess material and debris associated with this work from the job site.

**END OF SECTION**

## SECTION 03 3000

### CAST-IN-PLACE CONCRETE

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: Provide all labor, materials, equipment and services to complete all concrete work required, including, but not limited to, the following:
1. Slabs-on-ground.
  2. Installation of all bolts, inserts, sleeves, connections, etc. in the concrete.
  3. Joint devices associated with concrete work.
  4. Miscellaneous concrete elements, including, but not limited to: equipment pads.
  5. Concrete curing.
  6. Coordination with other sections:
    - a. Make all preparations and do all work necessary to receive or adjoin other work. Install all bolts and anchors, including those furnished by other sections, into formwork and provide all required blocking.
    - b. Install all accessories embedded in the concrete and provide all holes, blockouts and similar provisions necessary for the work of other sections. Provide all patching or cutting made necessary by failure or delay in complying with this requirement at the Contractor's expense.
    - c. Coordinate with other sections for the accurate location of embedded accessories.
- B. Related Sections:
1. Pertinent Sections of Division 01 specifying Quality Control and Testing Laboratory services.
  2. Pertinent Sections of Division 03 specifying concrete construction.
  3. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete.
  4. Pertinent sections of other Divisions specifying floor finishes and sealants applied to concrete substrates.

##### 1.02 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC) Chapter 19A Concrete.
- B. American Concrete Institute (ACI) PRC-211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete"
- C. ACI SPEC-301 "Specifications for Concrete Construction".
- D. ACI PRC-302.1 "Guide for Concrete Floor and Slab Construction".
- E. ACI PRC-304 "Guide for Measuring, Mixing, Transporting, and Placing Concrete".
- F. ACI SPEC-305.1 "Specification for Hot Weather Concreting".

- G. ACI SPEC-306.1 "Standard Specification for Cold Weather Concreting".
- H. ACI SPEC-308.1 "Specification for Curing Concrete".
- I. ACI CODE-318 "Building Code Requirements for Structural Concrete and Commentary".

### 1.03 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer. Submittals that do not meet these requirements will be returned for correction without review. Submit for review prior to fabrication.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents.
- C. Product Data: Submit manufacturers' data on manufactured products and other concrete related materials such as bond breakers, cure/sealer, admixtures, etc. Demonstrate compliance with specified characteristics. Provide samples of items upon request. Submit material certificates for concrete aggregates and cementitious materials. Certificates shall show compliance to applicable ASTM's, the CBC, and additional requirements stated herein.
- D. Mix Designs: Submit Mix Designs for each structural concrete type required for work per requirements of articles CONCRETE MIXES and QUALITY ASSURANCE. Resubmit revised designs for review if original designs are adjusted or changed for any reason. Non-Structural mixes need not be submitted for review by Structural Engineer.
- E. Shop Drawings: Proposed location of construction and cold joints. Proposed location of all slab construction/dowel joints, control joints, and blockouts.
- F. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.
- G. Batch Plant Ticket: Include with delivery of each load of concrete. Provide ticket to the Testing Agency and the Architect/Engineer as separate submittals. Concrete delivered to the site without such ticket shall be rejected and returned to the plant. Each ticket shall include all information specified in Article SOURCE QUALITY CONTROL below.
- H. Engineering Analysis: Prepared by a California-licensed Civil or Structural Engineer, justifying construction-imposed loads on slabs, beams, and walls which exceed those allowed by CBC for the specified use.
  - 1. 2000 lbs maximum allowable construction load without analysis.
  - 2. 10,000 lbs maximum allowable construction load with analysis.
- I. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

### 1.04 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- B. Concrete construction verification and inspection to conform to CBC 1705A.3.
- C. Common Sourcing: Provide each of the following materials from consistent sources for entire project.
  - 1. Cement.
  - 2. Fly ash.
  - 3. Aggregate.
  - 4. Slag Cement.
- D. Follow requirements of ACI SPEC-305.1 when concreting during hot weather. Follow requirements of ACI SPEC-306.1 when concreting during cold weather.
- E. Services by the Independent Testing Agency (includes "Special" Inspections) as specified in this Section and as follows:
  - 1. Perform tests and inspections specified below in articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and reports to be in conformance with pertinent Sections of Division 01.
- F. Contractor shall bear the entire cost of remediation, removal, and/or replacement of concrete determined defective or non-conforming, including Architect/Engineer fees for redesign.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Materials specified by brand name shall be delivered in unbroken packages bearing manufacturer's label and shall be brand specified or an approved equal.
- B. Delivery, Handling and Storage of other materials shall conform to the applicable sections of the current editions of the various reference standards listed in this Section.
- C. Protect materials from weather or other damage. Sort to prevent inclusion of foreign materials.
- D. Specific Requirements:
  - 1. Cement: Protect against dampness, contamination, and warehouse set. Store in weather tight enclosures.
  - 2. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregates. Use only one supply source for each aggregate stock pile.
  - 3. Admixtures:
    - a. Store to prevent contamination, evaporation, or damage.
    - b. Protect liquid admixtures from freezing and extreme temperature ranges.
    - c. Agitate emulsions prior to use.

#### **1.06 ENVIRONMENTAL REQUIREMENTS**

- A. Cold Weather (Freezing or near-freezing temperatures) per ACI SPEC-306.1:

1. Heat concrete materials before mixing, as necessary to deposit concrete at a temperature of at least 50°F but not more than 90°F.
2. Do not place concrete during freezing, near-freezing weather, snow, rain or sleet unless protection from moisture and/or cold is provided.
3. Protect from freezing and maintain at a temperature of at least 50°F for not less than seven days after placing. Take special precautions to protect transit-mixed concrete.
4. No salts, chemical protection or admixture are permitted without written approval of Architect/Engineer.
5. Contractor shall maintain an air temperature log for the first 7 days after placement with entry intervals not to exceed 8 hours.

B. Hot Weather per ACI SPEC-305.1:

1. Cool concrete materials before mixing, or add ice in lieu of mix water as necessary to deposit concrete at a temperature below 85°F.
2. Do not place concrete in hot/windy weather without Architect/ Engineer review of procedures.
3. Provide sunshades and/or wind breakers to protect concrete during finishing and immediate curing operations. Do not place concrete at air temperature exceeding 90°F.
4. Provide modified mix designs, adding retarders to improve initial set times and applying evaporation reducers during hot/windy weather for review by Independent Testing Agency prior to use.

## 1.07 SCHEDULING AND SEQUENCING

- A. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the Testing Agency.
- B. Provide schedule and sequence information to Testing Agency in writing upon request. Update information as work progresses.

## PART 2 PRODUCTS

### 2.01 FORMWORK

- A. Comply with requirements of Section 03 1000.

### 2.02 REINFORCEMENT

- A. Comply with requirements of Section 03 2000.

### 2.03 MATERIALS

- A. General Requirements: All materials shall be new and best of their class or kind. All materials found defective, unsuitable, or not as specified, will be condemned and promptly removed from the premises.
- B. Cementitious Materials:
  1. Portland Cement: ASTM C150, Type II, low alkali.
  2. Fly Ash (Pozzolan): ASTM C618, Class F.
  3. Slag Cement: ASTM C989, Grade 100 or 120.

C. Concrete Aggregates:

1. Coarse and Fine Aggregates: ASTM C33; Stone aggregate and sand. Specific source aggregate and/or sand or shrinkage characteristics as required for class of concrete specified.
2. Source shall remain constant throughout the duration of the job. The exact portions of the fine aggregates and coarse aggregates to be used in the mix shall be determined by the mix design.
3. Aggregates shall be tested for alkali reactivity per CBC section 1903A.5. Where test results exceed allowable limits, additional testing of mitigation procedures shall be provided, as outlined per CBC section 1903A.5.

D. Water: ASTM C1602. Potable, clean, from domestic source.

E. Admixtures: All admixtures shall be used in strict accordance with the manufacturer's recommendations. Admixtures containing calcium chlorides or other accelerators shall not be used without the approval of the Architect/Engineer and the Owner's Testing Laboratory.

1. Normal or Mid Range Water Reducing Admixtures: ASTM C494 Type A, "MasterPozzolith" series or "MasterPolyeed" series by Master Builders Solutions, "WRDA" series by W.R. Grace, or equal.
2. Water Reducing Admixture and Retarder: ASTM C494 Type B or D, "MasterSet R" series or "MasterSet DELVO" series by Master Builders Solutions, "Plastiflow-R" by Nox-crete, or equal.
3. High Range Water-Reducing Admixtures: ASTM C494 Type F, "MasterRheoBuild 1000" or "MasterGlenium" series by Master Builders Solutions or equal.
4. Air Entraining Admixtures: ASTM C260, "MasterAir" series by Master Builders Solutions or equal.
5. Viscosity Modifiers: ASTM C494 Type S.

F. Slurry: Same proportion of cement to fine aggregates used in the regular concrete mix (i.e. only coarse aggregate omitted); well mixed with water to produce a thick consistency.

G. Dry Pack: Dry pack (used only for cosmetic concrete repairs) shall consist of:

1. One part cement to 2-1/2 parts fine aggregate (screen out all materials retained on No.4 sieve), mixed with a minimum amount of water, added in small amounts.
2. Mix to consistency such that a ball of the mixture compressed in the hand will retain its shape, showing finger marks, but without showing any surface water.

## 2.04 ACCESSORIES

A. Bonding Agent: ASTM C881, Type II Grade 2 Class B or C. Do not allow epoxy to set before placing fresh concrete.

1. "MasterEmaco ADH 326" by Master Builders Solutions;
2. "Rezi-Weld 1000" by W.R. Meadows.



- B. Chemical Hardener: Fluorosilicate solution designed for densification of cured concrete slabs. "MasterKure HD 300 WB" by Master Builders Solutions, "LIQUI-HARD" W.R. Meadows Co, or equal.
- C. Moisture-Retaining Cover: ASTM C171, type 1, one of the following;
  - 1. Regular Curing Paper, Type I, reinforced waterproof: Fortifiber Corporation "Orange Label Sisalkraft", "Pabcotite" paper, or equal.
  - 2. Polyethylene Film: ASTM D 2103, 4 mil thick, clear or white color.
  - 3. White-burlap-polyethylene sheet, weighing not less than 10 oz/per linear yd.
- D. Liquid Curing Compound: ASTM C 309, Type 1, Class B, clear or translucent, 25% minimum solids, water base acrylic cure/sealer which will not discolor concrete and compatible with bonding of finishes specified in related sections. W.R. Meadows Co. "Vocomp 25" or equal. Maximum VOC content shall comply with local requirements and California Green Building Code.
- E. Underslab Water Vapor Retarder: See Section 07 2500 "Weather Barriers".
- F. Evaporation Reducer: "MasterKure ER 50", by Master Builders Solutions.

## 2.05 JOINT DEVICES AND MATERIALS

- A. Expansion Joint Filler: ASTM D1751, Nonextruding, resilient asphalt impregnated fiberboard or felt, 3/8 inch thick and 4 inches deep; tongue and groove profile.
  - 1. Products: "Serviced Products", W.R. Meadows, Inc., "National Expansion Joint Company", "Celotex Corporation", or equal.
- B. Joint Filler: ASTM D944, Compressible asphalt mastic with felt facers, 1/4 inch thick and 4 inches deep.
- C. Sealant and Primer: As specified in Section 07 9200.
- D. Slab Joint Sealant: Compatible with floor finishes specified in related sections.

## 2.06 CONCRETE MIXES

- A. General requirements for mix design and submittal of structural class concrete:
  - 1. Provide Contractor submittals to Architect/Engineer not less than 15 days before placing concrete.
  - 2. Contractor shall review mix designs and proposed placing requirements prior to submittal for compatibility to ensure that the concrete as designed can be placed in accordance with the drawings and specifications.
  - 3. Changes or revisions require re-submittal: All variations to approved mix designs, including changing type and/or quantity of admixtures shall be resubmitted to the Architect/Engineer for review prior to use.
  - 4. Mix design(s) for all structural classes of concrete to be prepared by qualified person experienced in mix design. Allow for time necessary to do trial batch testing when required.

5. Preparer to provide backup data and certify in writing that mix design meets:
    - a. Requirements of the specifications for concrete durability and quality;
    - b. Requirements of the California Building Code and ACI CODE-318, including break histories, trial batching test results, and/or a mix designed by a California Registered Civil Engineer per ACI CODE-318 and bearing the Engineer's seal & signature.
  6. Clearly note on mix designs with specified maximum W/CM if design permits addition of water on site, or clearly identify in the mix design that no water is to be added on site.
  7. Deviations: Clearly indicate proposed deviations, and provide written explanation explaining how the deviating mix design(s) will provide equivalent or better concrete product(s) than those specified.
  8. Include adjustments to reviewed mix designs to account for weather conditions and similar factors.
- B. Proportioning - General: The following provisions apply to all mix designs:
1. Proportion concrete mixes to produce concrete of required average strength (as defined by ACI CODE-318). Select slump, aggregate sizes, shrinkage, and consistency that will allow thorough compaction without excessive puddling, spading, or vibration, and without permitting the materials to segregate, or allow free water to collect on the surface.
  2. Select aggregate size and type to produce dense, uniform concrete with low to moderate shrinkage, free from rock pockets, honeycomb and other irregularities.
  3. Mix designs may include water reducing and retarding admixtures to meet or exceed minimum set times (time required to place and finish) and to minimize Water-Cementitious Materials Ratios (W/CM). Minimum and maximum criteria presented in this section are guidelines and do not represent a specific mix design.
  4. Cement Content: Minimum cement content indicates minimum sacks of cementitious material. Increasing cement content to increase early strengths or to achieve specified W/CM while maintaining water content is discouraged in order to minimize effects of shrinkage.
    - a. Substitution of fly ash for Portland cement on an equivalent weight basis up to 25% replacement is permitted, except at high early strength concrete. Replacement in excess of 25% is not permitted unless part of a specified mix design that has been submitted for review.
    - b. Substitution of slag cement for Portland cement on an equivalent weight basis up to 45% replacement is permitted, except at high early strength concrete. Replacement in excess of 45% is not permitted unless part of a specified mix design that has been submitted for review.
    - c. Such substitution requests may be denied by the Engineer.
  5. Water Content: Mix designs with a specified maximum W/CM may be designed with a lower W/CM than specified in order to allow addition of water at the site.
  6. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301 and this section.
    - a. For trial mixtures method, employ independent testing agency acceptable to Architect/Engineer for preparing and reporting proposed mix designs.
    - b. Per DSA IR19-3, trial batching or historic breaks shall be used where fly ash substitution for cement is greater than 15%.
  7. Placement Options: Mix designs may, at the Contractor's option, be designed for either pump or conventional placement with aggregate size, slumps, etc. to be maintained as specified in this section.

- C. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations and this section.

D. Mix Design Minimum Requirements:

Concrete Class	Coarse Aggregate Size (Inches) & Fine Aggregate <sup>3</sup>	Maximum W/CM or Maximum Nominal Slump & Tolerance (Inches) <sup>1,2</sup>	Minimum 28-Day Design Strength	Minimum Cement Sacks/per yd <sup>4</sup>
<b>NON-STRUCTURAL</b>				
1) Slab on Ground Exterior (Equipment Pads)	1" x #4	W/CM = .55	3,000	4.5
<b>STRUCTURAL</b>				
2) N/A				

1. The tolerance is the maximum deviation allowable without rejection. The mix design shall be based on the nominal value specified and is without water reducing mixtures. Slump to be measured at the end of the hose.
2. The maximum W/CM is limited at time of placement as noted. No water is to be added on site such that the specified W/CM or maximum slump is exceeded without approval of the testing laboratory and the Architect/Engineer. Workability is to be achieved utilizing an acceptable mid range to high range water reducing admixture.
3. Gradation of aggregate is per ACI CODE-318 and ASTM C33.
4. Minimum cement content includes all cementitious materials.

**2.07 MIXING CONCRETE**

- A. Batch final proportions in accordance with approved mix designs. All adjustments to approved proportions, for whatever reason, shall be reviewed by the Architect/Engineer prior to use.
- B. Batch and mix concrete in accordance with ASTM C94, at an established plant. Site mixed concrete will be rejected.
- C. Provide batch and transit equipment adequate for the work. Operate as necessary to provide concrete complying with specified requirements.
- D. Place mixed concrete in forms within 1-1/2 hours from the time of introduction of cement and water into mixer or 300 revolutions of the drum whichever comes first. Use of, re-mixing, and/or tempering mixed concrete older than 1 hour will not be permitted.
- E. Do not add water at the site to concrete mixes with a maximum specified W/CM unless the water content at batch time provides for a W/CM less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the mix design and certification by the mix preparer. See ASTM C94 for additional requirements.

**2.08 SOURCE QUALITY CONTROL**

- A. Services by independent Testing Agency:
  1. Where aggregate alkali reactivity testing (and, when applicable, mitigation testing) per the MATERIALS section is not available, the Testing Agency shall perform this testing to verify materials conformance to CBC section 1903A.5.

2. Batch Plant inspection at automated plants to occur at commencement of concrete work each day (first truck). Batch Plant inspection at non-automated plants and when accuracy is questionable shall be continuous. Additionally, water cement ratio (WCR) is to be verified where a WCR is specified herein. The computed WCR is to be written on the Batch Plant Certificate to be taken to the job site prior to the truck leaving the plant. See requirements of CBC 1705A.3.3.
3. Batch Plant Certificates: Obtain the weighmaster's Batch Plant Certificate at arrival of truck at the site. If no batch plant certificate is provided, recommend to the General Contractor that the truckload of concrete be rejected. So note in daily log, along with the location of the load of concrete in the structure if the load is not rejected. See requirements of CBC 1705A.3.3.
  - a. Laboratory's inspector shall obtain for each transit mixer Batch Plant Certificates to verify mix design quantities and condition upon delivery to the site.
  - b. Certificates to include: Date, time, ingredient quantities, water added at plant and on job, total mixer revolutions at time of placement, and time of departure.
  - c. Concrete with specified water cement ratio: Add no water on site unless mix design and batch records each show additional water may be added. See ASTM C94 for additional requirements.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify lines, levels, and dimensions before proceeding with work of this section.
- B. Verify work of other sections is complete and tested as required before proceeding.

#### **3.02 PREPARATION**

- A. Observation, Inspection and Testing:
  1. Architect/Engineer: Notify not less than 2 working days before each concrete placement, for observation and review of reinforcing, forms, and other work prior to placement of concrete.
  2. Testing Agency: Notify not less than 24 hours before each placement for inspection and testing.
- B. Placement Records: Contractor shall maintain records of time, temperature and date of concrete placement including mix design and location in the structure. Retain records until completion of the contract. Make available for review by Testing Agency and Architect/Engineer.
- C. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.
- D. Verify location, position and inclusion of all embedded and concealed items.
- E. Verify installation of vapor retarder under interior slabs on ground, as specified in related section, is complete.
- F. Cleaning and Preparation:

1. Remove loose dirt, mud, standing water, and foreign matter from excavations and cavities.
  2. Close cleanout and inspection ports securely.
  3. Thoroughly clean reinforcement and other embedded items free from loose rust and foreign matter. Maintain reinforcing securely in place. Do not place concrete on hot reinforcing.
  4. At cold joints, remove laitance from previously placed concrete surface.
  5. Dampen form materials and substrates on which concrete is to be placed at least 1 hour in advance of placing concrete; repeat wetting as necessary to keep surfaces damp. Do not saturate. Do not place concrete on saturated material.
    - a. Thoroughly wet wood forms (except coated plywood), bottom and sides of trenches, adjacent concrete or masonry and reinforcement.
    - b. Concrete slabs on base rock, dampen rock.
    - c. Concrete slabs on vapor retarder, do not wet vapor retarder.
  6. Verify that metal forms are clean and free of rust before applying release agent.
  7. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- G. Drill holes in existing concrete at locations where new concrete is doweled to existing work. Insert steel dowels and prepare connections as detailed.
- H. Do not overcut at existing concrete work to remain. Contractor is responsible for repair/replacement of overcut concrete to the Owner's satisfaction.

### 3.03 PIPES AND CONDUITS IN CONCRETE

#### A. Slabs-on-Ground:

1. No pipe or conduit exceeding 1 inch outside diameter shall be embedded within the specified slab thickness except as specifically detailed.
2. Do not stack or abut pipes, maintain 3 inches minimum clearance.

#### B. Sleeving and Wrapping:

1. Foundations: Sleeve or wrap all individual pipe penetrations, minimum 1-1/2 inches clear to reinforcing all around.
  - a. Sleeves: PVC. Provide 1 inch minimum clear all around O.D. pipe to I.D sleeve, UNO at ends, fill void space with mastic or plastic bituminous cement.
  - b. Wrapped Vertical Pipes: Provide 1/8 inch nominal sheet foam with three wraps minimum, UNO.
  - c. Wrapped Horizontal Pipes: Provide 1/8 inch nominal sheet foam with eight wraps minimum, UNO.
  - d. Underground Fire Lines 4" and Larger: At sleeves provide 2 inch minimum clear all around O.D. pipe to I.D sleeve. At wrapped pipes, provide 1/8 inch nominal sheet foam with sixteen wraps minimum.
2. Slabs or Curbs: Wrap pipes as described above.

- C. Space groups of pipes/conduits at least 3 sleeve diameters apart, do not interrupt specified concrete and reinforcement.

1. Provide block-outs as detailed when grouping of pipes/conduits in foundation or other structural member prevents spacing as described. Notify Architect/Engineer for review of any conditions not conforming to details.
2. Center pipe/conduit penetrations in the depth and/or thickness of foundations.
3. Maximum size of pipe/conduit penetrations shall not exceed the least dimension of concrete divided by 3.

### 3.04 CONCRETE PLACEMENT

#### A. Transporting:

1. Provide clean, well-maintained equipment of sufficient quantity and capacity to execute the work and produce concrete of quality specified.
2. Handle and transport concrete from mixer to final deposit location as rapidly as practicable. Prevent separation or loss of ingredients.

#### B. Perform concrete placement by methods which will not puncture, damage or disturb vapor retarder membrane. Repair all damage to vapor retarder membrane before covering.

#### C. Placement - General: Placement, once started, shall be carried on as a continuous operation until section of approved size and shape is completed. Provide construction joints as detailed on the drawings. Engineer's written approval required for all deviations.

##### 1. Deposition:

- a. Deposit concrete to maintain an approximately horizontal plastic surface until the completion of the unit placement.
- b. Deposit as neatly as practicable in final position, minimize re-handling or flow.
- c. Do not drop concrete freely where reinforcing bars, embeds, or obstructions occur that may cause segregation. Provide spouts, elephant trunks, or other means to prevent segregation during placement.

##### 2. Progress Cleaning: Remove all concrete spilled on forms or reinforcing steel in portions of structure not immediately concreted. Remove completely before concrete sets.

##### 3. Interruptions: Shut down placement operations and dispose of all remaining mixed concrete and concrete in hoppers or mixers following all interruption in placement longer than 60 minutes.

- a. If such interruption occurs, provide new or relocate existing construction joints as directed by Engineer.
- b. Cut concrete back to the designated line, cleaning forms and reinforcing as herein specified.
- c. Prepare for resumption of placement as for new unit when reason for interruption is resolved.

#### D. Consolidation:

##### 1. Consolidate all concrete thoroughly during placement with high-speed mechanical vibrators and other suitable tools. Perform manual spading and tamping to work around reinforcement, embedded fixtures, and into corners of formwork as required to obtain thorough compaction.

- a. Provide vibrators with sufficient amplitude for adequate consolidation.
- b. Use mechanical vibrators at each point of concrete placement.

- c. Keep additional spare vibrators, in addition to those required for use, at the site for standby service in case of equipment failure.
  2. Consolidate each layer of concrete as placed.
    - a. Insert vibrators vertically at points 18 to 30 inches apart; work into top area of previously placed layer to reconsolidate, slowly withdraw vibrator to surface.
    - b. Avoid contact of vibrator heads with formwork surfaces.
    - c. Systematically double back and reconsolidate wherever possible. Consolidate as required to provide concrete of maximum density with minimized honeycomb.
- E. Unacceptable Materials:
  1. Do not place concrete that has started to set or stiffen. Dispose of these materials.
  2. Do not add water on site to concrete except as specified in the approved mix design, see PART 2 above.
- F. Protection of installed work:
  1. Do not introduce any foreign material into any specified drainage, piping or duct systems.
  2. Contractor shall bear all costs of work required to repair or clean affected work as a result of failure to comply with this requirement.

### 3.05 CONCRETE JOINTS

- A. Structural Joints (Construction/Cold Joints):
  1. Locate joints only where shown, or as approved.
  2. Review Required: Joints not indicated on the plans shall be located to meet the minimum requirements below, shall not impair the strength of the structure and shall be submitted to Architect/Engineer for review prior to placement of concrete.
    - a. Indicate proposed location(s) of construction/cold/expansion joints on shop drawing submittals for review prior to placing concrete.
  3. Clean and roughen all surfaces of previously placed concrete at construction joints by washing and sandblasting to expose aggregate to 1/4 inch amplitude.
  4. Slabs-On-Ground: Maximum Length of continuous placement shall not exceed 60 feet without special review by the Architect/Engineer. Alternate or stagger placement sections.
- B. Expansion/Construction Joints (Dowel Joints and Control Joints):
  1. Exterior Concrete Slabs on Ground (walkways, patios):
    - a. Expansion/ construction joints: Provide a 2 inch deep troweled groove or asphalt impregnated joint material embedded 50 percent of the slab depth at 12 feet on center, maximum.
    - b. Proportions: Place no section with a length larger than two times width. Additionally, place joints at all inside corners and at all intersections with other work.
- C. Joint Types:
  1. Dowel Joint: A keyed joint with smooth dowels passing through to allow unrestricted movement due to contraction and expansion. Joints are as specified on the drawings.



2. Control Joint(s): Shrinkage crack control joints may be of the following types when shown on the drawings. Install joints in a straight line between end points with edges finished appropriate to type. Depth shall be 25% of the slab thickness, unless noted otherwise. Fill joints with sealant as shown on the drawings or as required by related sections.
  - a. 1/4 inch wide troweled joint.
  - b. Keyed joint: Only at locations where concealed by other finishes.
  - c. Masonite Strip, 1/8 inch: Only at locations where concealed by other finishes.
  - d. Saw Cut, 1/8 inch: Must be performed within eight hours of completion of finishing. Do not make saw cuts if aggregate separates from cement paste during cutting operation. Prevent marring of surface finish. Fill with flexible sealant.

### 3.06 FLATWORK

#### A. General Requirements for All Concrete Formed & Finished Flat:

1. Edge Forms and Screeds: Set accurately to produce indicated design elevations and contours in the finished surface, edge forms sufficiently strong to support screed type proposed.
2. Jointing: Located and detailed as indicated.
3. Consolidation: Concrete in slabs shall be thoroughly consolidated.

#### B. Flatwork Schedule:

1. Exterior Slabs-On-Ground: Place concrete directly over sub-base as indicated.
  - a. Sub-Base: Clean free-draining, crushed base rock, 4 inch minimum thickness, thoroughly compacted.

### 3.07 FORMED SURFACES

- A. Form all concrete members level and plumb, except as specifically indicated. Comply with tolerances specified in ACI CODE-318, ACI SPEC-301, and this specification, except that maximum permissible deviation is 1/4 inch end-to-end for any single member.
- B. Cambers: Provide all cambers indicated in the formwork construction. Set screeds to produce specified cambers in the finished concrete.

### 3.08 CONCRETE FINISHES

#### A. Flatwork Finishing:

1. All exposed concrete flatwork surfaces shall be non-slip. See Architectural, Civil, and Landscape drawings.
2. Perform with experienced operators.
3. Finish surfaces monolithically. Establish uniform slopes or level grades as indicated. Maintain full design thickness.
4. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on drawings.
5. Flatwork Finish Types:
  - a. Wood Float Finish: Surfaces to receive quarry tile, ceramic tile, or cementitious terrazzo with full bed setting system, or wood frame for raised finished floors.

- b. Steel Trowel Finish: Surfaces to receive carpeting, resilient flooring, seamless flooring, thin set terrazzo, thin set tile or similar finishes specified in related sections. Trowel twice, minimum.
  - c. Broom Texture Finish: Exterior surfaces as indicated or for which no other finish is indicated. Finish as for steel trowel finish, except immediately following first troweling, (depending on conditions of concrete and nature of finish required) provide uniform surfaces texture using a medium or coarse fiber broom.
- B. Other Concrete: Provide as required to achieve appearance indicated on structural and architectural drawings and related sections.
1. Repair surface defects, including tie holes, immediately after removing formwork.
  2. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
  3. Exposed Form Finish: Finish concrete to match forms. Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
    - a. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
    - b. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
    - c. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.
  4. Intermediate joint and score marks and edges: Tool smooth and flush unless otherwise indicated or as directed by the Architect.
  5. Use steel tools of standard patterns and as required to achieve details shown or specified. All exposed corners not specified to be chamfered shall have radiused edges.

### 3.09 TOLERANCES

- A. Minimum Flatwork Tolerances: Measure flatness of slabs within 48 hours after slab installation in accordance with ACI PRC-302.1 and ASTM E1155 and to achieve the following FF and FL tolerances:
1. Exterior surfaces: 1/8 inch minimum per foot where sloped to drain. Level otherwise. FF20 and FL15.
  2. Interior surfaces not otherwise shown or required: Level throughout. FF25 and FL20
  3. Interior surfaces required to be sloped for drainage: 1/8 inch in 10 ft.
  4. Finish concrete to achieve the following tolerances:
    - a. Under Glazed Tile on Setting Bed: FF30 and FL20.
    - b. Under Resilient Finishes: FF35 and FL25.
    - c. Flooring manufacturer and pertinent section of Division 9.
- B. Formed Surface Tolerances:
1. Permanently Exposed Joints and Surfaces: Provide maximum differential height within two feet of, and across construction joints of 1/16 inch.
  2. Vertical Elevations: Elevation of surfaces shall be as shown or approved.

### 3.10 CONCRETE CURING

- A. Curing - General: Cure in accordance with ACI SPEC-308.1. Maintain concrete water content for proper hydration and minimize temperature variations. Begin curing immediately following finishing.
- B. Protection During Curing: Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. The General Contractor is responsible for the protection of the finished slab from damage.
  - 1. Avoid foot traffic on concrete for minimum of 24-hours after placement.
  - 2. Protect concrete from sun and rain.
  - 3. Maintain concrete temperature at or above 50 degrees F. during the first 7 days after placement. See Article ENVIRONMENTAL REQUIREMENTS.
  - 4. Do not subject concrete to design loads until concrete is completely cured, and until concrete has attained its full specified 28-day compressive strength or until 21 days after placement, whichever is longer.
  - 5. Protect concrete during and after curing from damage during subsequent building construction operations. See Article PROTECTION.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  - 1. Normal concrete: Not less than 7 days.
- D. Begin curing immediately following finishing.
- E. Surfaces Not in Contact with Forms:
  - 1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than 3 days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
  - 2. Begin final curing after initial curing but before surface is dry.
    - a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.
    - b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
  - 3. In addition, see specific conditions noted below.
- F. Slabs on Ground: Cure by one of the following methods:
  - 1. Water Cure (Ponding): Maintain 100 percent coverage of water over floor slab areas, continuously for minimum 7 calendar days.
  - 2. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
  - 3. Moisture-Retaining Film or Paper: Lap strips not less than 6 inches and seal with waterproof tape or adhesive; extend beyond slab or paving perimeters minimum 6 inches and secure at edges; maintain in place for minimum 7 days.
  - 4. Absorptive Moisture-Retaining Covering: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides and extend beyond slab or paving perimeters 6 inches minimum; maintain in place for minimum 7 days.

5. Liquid Membrane-forming Curing Compound: Provide only when subsequent concrete treatments or finish flooring specified in related sections will not be affected by cure/sealer. Apply curing compound in accordance with manufacturer's instructions at the maximum recommended application rate in two coats, with second coat applied at right angles to first.
- G. Formed Concrete Members: Cure by moist curing with forms in place for full curing period.
1. Protect free-standing elements from temperature extremes.
  2. Maintain forms tight for minimum 7 days. Maintain exposed surfaces continuously damp and completely covered by sheet materials thereafter.
  3. Maintain all shoring in place. Refer to related sections specifying formwork.
  4. Membrane Curing Compound: Apply compound in accordance with manufacturer's instructions in one coat.

### 3.11 CONCRETE HARDENER

- A. Apply hardener to all floor slabs not receiving other finishes after 30 days minimum curing. Clean slabs of non-compatible cure/sealers or other foreign material(s) and apply in strict accordance with the manufacturer's directions.

### 3.12 FIELD QUALITY CONTROL

- A. Testing and Inspections by Independent Testing Agency: Provided verification and inspection of concrete per CBC Table 1705A.3. Provide written reports for to Engineer, Architect, Contractor and Building Official for the following tests and inspections:
- B. Testing & Inspection: Provide periodic inspection of reinforcing steel. Provide continuous inspection during placement of structural class concrete, 3000 psi or more. Non-structural class concrete with a design strength of 2500 psi or less to have periodic inspection on a 150 cubic yard basis as required to assure conformance.
1. Provide periodic inspection of bolts in concrete prior to and during placement where so noted on the construction documents.
  2. Structural Concrete Cylinder Tests: Form in accordance with ASTM C31.
    - a. Take four standard 6 inch x 12 inch (or five 4 inch x 8 inch) cylinder specimens on the site, of each class of concrete as specified in PART 2, not less than once a day or for each 50 cubic yards or 2000 sq ft or fraction thereof placed each day.
    - b. Record the location of each concrete batch in the building in a log and also note on each specimen.
    - c. Perform standard compression test of cylinders in accordance with ASTM C39, one at 7 days and two (three for 4x8 cylinders) at 28 days.
    - d. Hold fourth (fifth) cylinder untested until specified concrete strengths are attained.
  3. Structural Concrete Slump Test and Air Tests: Perform slump in accordance with ASTM C143 and air content in accordance with C231 or C173 at the time of taking test cylinders, and/or at one-hour intervals during concrete placing.
  4. Measure and record concrete temperature in accordance with ASTM C1064 upon arrival of transit mixers and when taking specimens. Note weather conditions and temperature.
  5. Determine concrete density in accordance with ASTM C138 at the time of forming test cylinders.

6. Propose adjustments to reviewed mix designs for Architect / Engineer review to account for variations in site or weather conditions, or other factors as appropriate.
7. Water Vapor Transmission Tests: Floors receiving floor finishes specified in related sections will be tested prior to installation of flooring systems. Refer to sections specifying floor finishes for related requirements.

C. Services by Contractor:

1. Rejection of Concrete Materials: Do not use the following without prior written approval of the Architect/Engineer;
  - a. Materials without batch plant certificates.
  - b. Materials not conforming to the requirements of these specifications.

### 3.13 ADJUSTING

- A. Inspect all concrete surfaces immediately upon formwork removal. Notify Architect/Engineer of identified minor defects. Repair all minor defects as directed.
- B. Surface and Finish Defects: Repair as directed by the Architect/Engineer, at no added expense to the Owner. Repairs include all necessary materials; reinforcement grouts, dry pack, admixtures, epoxy and aggregates to perform required repair.
  1. Repair minor defective surface defects by use of drypack and surface grinding. Specific written approval of Architect/Engineer is required. Submit proposed patching mixture and methods for approval prior to commencing work.
  2. Slabs-on-Ground, Elevated Slabs and on Slabs on Metal Deck: Review for "curled" slab edges and shrinkage cracks prior to installation of other floor finishes. Grind curled edges flush, fill cracks of 1/16 inch and greater with cementitious grout.
  3. Grind high spots, fins or protrusions caused by formwork; Fill-in pour joints, voids, rock pockets, tie holes and other void not impairing structural strength. Provide surfaces flush with surrounding concrete.

### 3.14 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required compressive strength, lines, details, dimensions, tolerances, finishes or specified requirements; as determined by the Architect/Engineer.
- B. Repair or replacement of defective concrete will be determined by the Architect/Engineer who may order additional testing and inspection at his option. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- C. Specific Defects:
  1. "Low-Strength"; Concrete Not Meeting Specified Compressive Strength after 28 days:
    - a. Concrete with less than 25% Fly Ash or 35% Slag as cementitious material: Test remaining cylinder(s) at 56 days. If strength requirements are met, concrete strength is acceptable.
    - b. Concrete with 25% or more Fly Ash or 35% or more Slag as cementitious material: Test remaining cylinder(s) at 70 days. If strength requirements are met, concrete strength is acceptable.

2. Excessive Shrinkage, Cracking, Crazeing or Curling; Defective Finish: Remove and replace if repair to acceptable condition is not feasible.
3. Lines, Details, Dimensions, Tolerances: Remove and replace if repair to acceptable condition is not feasible.
4. Slab sections not meeting specified tolerances for trueness/flatness or lines/levels: Remove and replace unless otherwise directed by the Architect/Engineer. Minimum area for removal: Fifteen square feet area unless directed otherwise by the Architect/Engineer.
5. Defective work affecting the strength of the structure or the appearance: Complete removal and replacement of defective concrete, as directed by the Architect/Engineer.

### **3.15 CLEANING**

- A. Maintain site free of debris and rubbish. Remove all materials and apparatus from the premises and streets at completion of work. Remove all drippings; leave the entire work clean and free of debris.
- B. Slabs to Receive Floor Finishes Specified in other sections: Remove non-compatible cure/sealers or other foreign material(s) which may affect bonding of subsequent finishes. Leave in condition to receive work of related sections.

### **3.16 PROTECTION**

- A. Protect completed work from damage until project is complete and accepted by Owner.
- B. Construction Loads: Submit engineering analysis for equipment loads (including all carried loads) specified in article submittals.
- C. Keep finished areas free from all equipment traffic for a minimum of 4 additional days following attainment of design strength and completion of curing.
- D. Protection of Drainage Systems:
  1. Care shall be taken not to introduce any foreign material into any specified drainage, piping or duct system.
  2. Cost of work to repair or clean drainage system as a result of failure to comply with this requirement will be back charged to the contractor.
- E. Cover traffic areas with plywood sheets or other protective devices; maintain protection in place and in good repair for as long as necessary to protect against damage by subsequent construction operations.

**END OF SECTION**

## SECTION 06 1000

### ROUGH CARPENTRY

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section Includes: All labor, materials and equipment and all operations required to complete all rough carpentry and structural framing as indicated on the drawings; to produce shapes and configurations as shown, as required; and as specified herein, including:
1. Structural floor, wall, and roof framing.
  2. Floor, wall, and roof sheathing.
  3. Rough hardware, framing connectors and fasteners.
  4. Treatment of wood.
  5. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, and other work requiring supporting blocking.
  6. Miscellaneous wood nailers and furring strips, including roof applications, other wood framing, furring, shims or blocking as required to complete the work.
- B. Related Sections:
1. Pertinent sections of Division 01 specifying Quality Control and Testing Agency services.
  2. Pertinent sections of Division 01 specifying Structural Product Requirements: Structural Product Options, Substitution procedures and limitations, transportation, handling and storage.
  3. Pertinent sections of Division 03 specifying wood formwork construction and/or setting anchors in concrete.
  4. Pertinent section of Division 06 specifying wood construction and materials.
  5. Pertinent sections of other divisions specifying steel or concrete construction.

##### 1.02 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 23 Wood.
- B. American National Standards Institute (ANSI) / American Wood Council (AWC) "NDS - National Design Specification for Wood Construction".
- C. National Institute of Standards and Technology (NIST) / Engineered Wood Association (APA) "PS 1 - Voluntary Product Standard for Structural Plywood".
- D. NIST / APA "PS 2 - Performance Standard for Wood-Based Structural-Use Panels".
- E. NIST "PS 20 - American Softwood Lumber Standard".
- F. West Coast Lumber Inspection Bureau (WCLIB) "Standard Grading Rules for West Coast Lumber No. 17".
- G. Western Wood Products Association (WWPA) "Western Lumber Grading Rules".

- H. American Wood Preservers Association (AWPA) "Book of Standards".

### 1.03 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. Submit for review prior to fabrication. Submittals that do not meet these requirements will be returned for correction without review.
1. Substitutions for products specified require conformance to substitution requirements in Division 01.
  2. Review of materials and hardware for substitution to products specified is at the additional expense of the Contractor.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer.
- C. Product Data:
1. Submit manufacturer's product data, specifications, and installation instructions for & location of framing connectors, wood preservative materials, application instructions, and fasteners. Include complete, accurate equivalence data when submitting alternate products to those specified. Provide samples of these items upon request.
  2. Submit product data and current ICC-ES report for machine-driven nails, fasteners, and equipment, including dimensions of all fasteners, including head, shank diameter and length.
- D. Manufacturer's Certificate: Submit all certifications of physical and chemical properties of materials as specified below in Article titled QUALITY ASSURANCE.
1. Certify that wood products supplied for rough carpentry meet or exceed specified requirements, including specified moisture content.

### 1.04 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies, refer to pertinent sections of Division 01 and CBC Chapter 17A.
- B. All tests shall be performed by a recognized testing agency as specified in pertinent sections of Division 01.
- C. Inspection of fabricators is required per CBC 1704A.2 unless fabricator is registered and approved by the building official. Wood product quality standards:
1. All wood products to comply with article REFERENCES.
  2. Factory-mark each piece of lumber and sheathing with type, grade, mill, and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
  3. Sheathing panels to be marked by APA (The Engineered Wood Association).



- D. End-Jointed lumber shall not be used.
- E. Hardware and engineered wood products shall have current ICC ES Evaluation/research reports that are equivalent to products specified.
- F. Employ competent workers experienced in work of the types specified and required.

#### **1.05 MOCK-UP**

- A. Construct mock-ups of machine-driven nailed sheathing panels using submitted products and demonstrating conditions indicated. Locate where directed.
- B. Mock-up shall be accepted and approved by the Inspector of Record (IOR) before commencement of machine-driven nailing activity.
- C. Accepted mock-up shall remain exposed for reference for the duration of machine-driven nailing activity.
- D. Remove all mock-ups at the completion of the work.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Comply with pertinent requirements of Division 01.
- B. Delivery: Time delivery and installation of carpentry products to avoid delaying other trades whose work is dependent on or affected by this section and to comply with moisture content, protection and storage requirements.
- C. Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and sheathing panels to prevent deformation and provide air circulation within stacks.
  - 1. Store materials for which a maximum moisture content is specified only in areas where relative humidity has been reduced to a level where specified moisture content can be maintained.
  - 2. Handle and store materials above ground to prevent damage, contamination, or accumulation of dirt or foreign materials.
  - 3. Provide special protection for horizontal sheathing panels. Deformation of panels due to moisture is not acceptable.

#### **1.07 PROJECT/SITE CONDITIONS**

- A. Verify all conditions at project site affecting the work; work to field dimensions as required. Coordinate carpentry installation with size, location, and installation of service utilities.
- B. Sequence rough carpentry installation activities to allow sufficient time for:
  - 1. Review of all submittals.
  - 2. Fabrication of mock-ups and required durations as specified.

3. Indicate submittal review, procurement, mock-up, and testing activities in the project schedule prior to the start of installation. Installation durations shall be based on hand-nailed installation methods specified.
4. Attainment of specified maximum lumber moisture content.

## **PART 2 PRODUCTS**

### **2.01 DIMENSIONED LUMBER**

#### **A. General**

1. Size per industry standards for nominal sizes shown; S4S (sanded four sides).
2. Warped/twisted and excessively checked members shall not be used regardless of grade marks.
3. At the Contractor's option, engineered lumber of equivalent size and material properties may be substituted for solid sawn lumber where material is difficult to source due to length, availability, etc. Submit proposed substitution to Engineer for review prior to purchasing materials.

#### **B. Moisture content of framing:**

1. All lumber to be maximum 19% at time of fastener installation. All lumber to be maximum 19% at time of close-in, unless noted otherwise.
2. The Owner's Testing Laboratory will test for moisture content prior to commencement of close-in.
3. The Contractor shall recognize that excessive shrinkage of lumber results from excess moisture content at the time of installation. The Contractor will compensate for use of such lumber by waiting for acceptable moisture content before close in and/or by replacing/repairing lumber that has sagged, twisted, or warped prior to close in.
4. Deviation from this specification would require structural redesign of connections and fasteners.

#### **C. Sills/ledgers on concrete: No. 2 pressure treated Douglas Fir and as called for on the drawings.**

#### **D. Interior structural framing shall be Douglas Fir (D.F.) with grades as noted below, unless otherwise specified on the drawings. All grades are per WCLIB standard grading rules.**

1. All permanently exposed (interior or protected from weather) framing shall be select structural grade with no box heart.
2. Except per 1 above, unless noted otherwise, minimum grades are:
  - a. Floor/roof joists/rafters (2x) and 2x8 & larger studs & plates: D.F. No. 1
  - b. 2x4 and 2x6 studs and plates: D.F. No. 1
  - c. 4x and larger: D.F. No. 1
  - d. Blocking: D.F. No. 2
  - e. 6x8 and larger posts and beams may be SGL/CGL per below unless noted otherwise on the drawings.

#### **E. Framing not otherwise shown or specified: Douglas Fir construction grade per WCLIB paragraphs applicable to uses and sizes required.**

### **2.02 STRUCTURAL SHEATHING PANELS**

- A. Plywood: Structural sheathing shall conform to product standard PS-1 or PS-2. All panels shall have a minimum bond classification of "Exposure 1" and bear the trademark of the Engineered Wood Association (APA) or other qualified agency. Grades shall be "Rated Sheathing" or "Structural 1" as required on the drawings.
- B. Oriented Strand Board (OSB): All structural OSB shall be grade marked by a qualified agency for conformance with Product Standard PS-2 and shall be fabricated with exterior glue. Grades shall be as required on the drawings.

### 2.03 TREATED WOOD:

- A. Treated Lumber and Plywood: Comply with requirements of AWWA Standard U1. See Standard U1 for "Use Category" designations. Do not provide higher Use Category lumber than that specified. Maximum moisture content shall be the same as required for "dimensioned lumber" as specified above.
- B. Preservative Treated Lumber
  - 1. General
    - a. Preservatives shall be waterborne. Preservative retention rate shall be as required per AWWA Standards U1 & T1. Lumber shall be Douglas Fir No. 2 (or better). Cut faces of treated wood shall be brush treated (two complete applications) prior to installation.
    - b. Lumber less than 8 inches above grade and lumber less than 6 inches above exterior hard-surface flatwork shall be treated.
    - c. Each piece of wood shall be stamped by the wood preservative applicator to identify its treatment and preservative retention.
  - 2. Lumber at interior, non-weather exposed locations installed adjacent to concrete or masonry shall be Use Category UC2. Examples include sill plates & ledgers and lumber in contact with roofing, flashing, or water proofing. Borate treated lumber meeting AWWA UC2 is acceptable in this application.
  - 3. Maximum Volatile Organic Compound (VOC) content of field-applied preservative shall meet local air quality standards and the California Green Building Code.

### 2.04 FASTENERS AND ACCESSORIES

- A. General requirements for fasteners:
  - 1. Fasteners shall be of adequate size, spacing, and number to resist design loads under intended use, and types shall be appropriate for the materials or conditions for which used.
  - 2. Provide washers, pre-drilling, etc. as required for proper installation and to prevent damage to framing.
  - 3. Fasteners shall be hot-dip galvanized (ASTM A153), mechanically galvanized (ASTM B695 class 55 minimum), stainless steel (type 303, 304, 305, or 316), silicon bronze, or copper by approved methods for the following applications:
    - a. Exterior, exposed use.
    - b. In contact with preservative or fire-retardant treated wood.
    - c. Nails in contact with preservative treated wood containing ammonia shall be stainless steel.
  - 4. Fasteners in moist corrosive atmosphere to be of stainless steel (type 303, 304, 305, or 316).

5. Where the retention level of ACQ or MCQ preservative is greater than 0.40 pcf, CBA-A preservative is greater than 0.41 pcf, or CA-B preservative is greater than 0.21 pcf, provide stainless steel fasteners (type 303, 304, 305, or 316).
  6. All fasteners specified by manufacturer shall be installed in framing hardware, unless noted otherwise.
  7. At borate treated lumber a clear zinc coating per ASTM F1941 is acceptable.
- B. Nails and nailing not otherwise shown or specified:
1. Comply with requirements of governing building code.
  2. For securing materials to hardened concrete or masonry provide hardened steel masonry nails or Simpson Strong-Tie "Titen" screws.
  3. For framing and general woodwork: Common bright wire nails (not box nails) with centered full-round heads per ASTM F1667 including Supplement S1. 16d cement coated sinker nails may be used in lieu of common nails for framing, where noted on the drawings. Unless otherwise noted on drawings, nail sizes shall be as follows:
    - a. 8d Common: 0.131"  $\varnothing$  x 2-1/2" long with 0.281"  $\varnothing$  head.
    - b. 10d Common: 0.148"  $\varnothing$  x 3" long with 0.312"  $\varnothing$  head.
    - c. 16d Common: 0.162"  $\varnothing$  x 3-1/2" long with 0.344"  $\varnothing$  head.
  4. Nails for sheathing panels shall be of common wire with full round heads and shall be of sufficient length to fully develop the nails.
  5. Machine-driven nails of all types must comply with the requirements of this section. All proposed nails shall match diameter and penetration of specified nails.
  6. Staples shall conform to length and gauges specified and shall be installed to match specified patterns and spacing.
  7. Power Actuated Fasteners (PAF): Use only as approved by the Architect/Engineer; operators shall be qualified.
- C. Bolts: Malleable iron washers or steel plate washers, unless otherwise shown, shall be provided under all bolt heads and nuts.
1. Machine Bolts: ASTM A307 and ANSI/ASME B18.2.1, standard semi-finished machine bolts as shown or required. Nuts shall be standard size unless noted otherwise and shall be per ASTM A563.
  2. Anchor bolts or threaded rod anchors shall conform to ASTM F1554, ASTM A307, or ASTM A36. Anchor bolts shall be headed or end in two nuts tightened against one another, unless noted otherwise. Provide embedded plate washer as indicated on drawings. No upset threads allowed. No L or J bolts allowed.
- D. Lag screws: Standard hex lag screws per ANSI/ASME B18.2.1.
- E. Wood screws: Standard wood screws per ANSI/ASME B18.6.1.
- F. Power Actuated Fasteners (PAF): Hilti X-CP72, ICC ESR-2379; Simpson PDPRAWL-300 MG, ICC ESR-2138.
- G. Framing hardware: Fabricated sheet metal timber framing connectors shall be manufactured from painted or galvanized G90 steel by Simpson Strong-Tie (connectors specified on drawings are per Simpson Strong Tie, USP Lumber Connectors, or approved equivalent. Connectors shall be at least 16 gauge material, (1/8 inch plate materials where welded), unless otherwise noted, punched for nailing. All heavy hardware to be fabricated from A36 steel per Division 05,

Metals. All hardware intended for exterior exposed use shall be galvanized per G185 ASTM A653 or stainless steel.

1. For contact with preservative or fire-retardant treated wood, provide minimum G185 galvanizing per ASTM A653.
2. Nails and nailing shall conform to the manufacturer's instructions with a nail provided for each punched hole. Nails to be used with framing accessories are subject to the requirements specified in this Section for fasteners and anchors.

## 2.05 SOURCE QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform testing for moisture content of all lumber at time of fastener installation.
- B. The Testing Agency will submit reports as specified in Division 01.

## PART 3 EXECUTION

### 3.01 REQUIREMENTS FOR STRUCTURAL FRAMING

- A. General
  1. Refer to drawings for layouts, notes and details, provide framing as required; comply with governing building code requirements.
  2. Provide framing to achieve true alignments as surfaces receiving finish materials.
  3. It shall be the responsibility of the Contractor to provide and install all wood blocking, furring strips, or grounds detailed or required to provide anchorage for all finishes, accessories, fixtures, etc. as required to complete all work. All blocking and/or backing shall be securely bolted or otherwise anchored in place.
  4. Contractor shall be responsible for layout of anchor bolts, and other hardware embedded in concrete when placed by other trades.
  5. Provide and install all structural framing, blocking, fasteners, brackets, clips, etc. as required to complete work specified in the Construction Documents.
- B. Framing
  1. Sill Plates and Ledgers:
    - a. Sill plates and ledgers on concrete shall be anchored with bolts, unless noted otherwise, shall have full bearing on concrete, and shall be placed for sheathing panel nailing as indicated. All bolt nuts shall be provided with a cut plate steel washer for bearing on wood.
    - b. Provide a minimum of two sill anchor bolts per sill piece with a bolt no less than 4 1/2" and no more than 12" from the end of the sill. Bolts to be 5/8" diameter x 12" (18" at curb) long at 48" on centers, unless otherwise shown or noted. Provide additional anchor bolts each side of a notch or hole, as per a typical plate splice, where notch or hole is in excess of 1/3 the plate width. At shear walls, provide a plate washer 3" x 3" x 0.229" minimum between the sill and nut at anchor bolts. Plate washer to extend within 1/2 inch of the structural wall sheathing. Offset and/or stagger anchor bolts, or provide larger plate washer as required.
    - c. Anchor bolt holes in sill plates or ledgers shall be 1/16" maximum larger than anchor bolt.

2. Stud Walls and Framing:
  - a. Cut studs and posts with square ends, unless otherwise shown or noted. All posts and beams shall be "cut to bear" unless otherwise detailed.
  - b. All studs in walls shall be placed with the shortest dimension parallel to the run of the wall. Bearing studs shall extend full height to be the supporting framing as shown; non-bearing studs shall extend to the supporting framing.
  - c. Provide double studs on each side of all openings, unless shown or noted otherwise.
  - d. All openings in stud walls and partitions shall be framed with headers across the top, as shown, with a minimum size (6" nominal depth x stud width) resting on short cripple studs, and as shown on the drawings.
  - e. All stud partitions and walls shall have horizontal solid blocking not less than 2x and of the same width as the stud, fitted and nailed into the studs at mid-height of stud, for studs over 8 feet in height, except as otherwise shown or specified. This blocking shall be so spaced that there shall be no concealed air spaces greater than eight feet in any dimension.
  - f. Stud partitions containing plumbing, heating or other pipes shall be so framed as to give proper clearance for piping. Plumbing, heating and vent pipes exceeding 1-1/2" in inside diameter shall not be placed in partitions used as bearing or shear walls unless completely furred clear of the wall. No notching shall be allowed. Pipes shall be placed in the center of the plate using a neat bored hole and the plates shall be strapped on each side with 3" x 36" x 14 gauge steel punched for 10d nails 3" on center, staggered, or as shown on the drawings.
3. Top Plates
  - a. Top plates shall be double, set single. Corners where stud wall or partitions meet shall be framed with studs on all surfaces and blocking to form a "rigid" corner with nailing for all corners. Double top plates shall be lapped at corners. Lap splices and nailing per the drawings.
4. Floor, Roof and Ceiling Framing
  - a. Joists and beams shall be accurately aligned and the position and spacing of all joists and beams shall be as shown and be coordinated with other framing and to other trades prior to actual construction.
  - b. Place all joists and beams with crown up. Cantilevered joists and beams shall be placed with the crown down.
  - c. Cutting of wood girders, beams or joists for electrical and mechanical lines shall be limited to cuts and bored holes not deeper than 1/5 of the beam depth from the top and located not farther from the support than three times the beam depth and not less than the beam depth. Cuts in excess of this, or single bored holes with a diameter of more than 1" are not permitted without special provisions for framing the beams. Location of all cuts in framing shall receive the prior review of the Architect/Engineer.
  - d. Provide vent holes in rafters and/or blocking as shown and/or directed by the Architect.

### 3.02 STRUCTURAL SHEATHING

#### A. General

1. Sheathing nailing shall be as required on the drawings. Do not overdrive (Do not break skin of sheathing face sheet). Over driving will be cause for rejection.

2. Form sheathing may be re-used for concealed sheathing provided the lumber at the time of re-use is approved by the Architect, meets with the framing grade requirements specified herein, is in good condition, and is thoroughly cleaned with all nails removed.
  3. Pneumatic nailing devices shall be adjustable so that nail heads do not penetrate skin of sheathing. Contractor shall submit equipment and nails for review prior to use. Refer to PART 2 for other nailing requirements.
- B. Roof and Floor Sheathing: Lay with face grain perpendicular to roof rafters, roof trusses or floor joists. Stagger sheets. Block all unsupported sheet edges with 2x material unless noted otherwise.
- C. Wall Sheathing: Lay with face grain either parallel or perpendicular to studs. Exposed bottom edges shall be sealed as recommended by manufacturer. Block all unsupported sheet edges with 2x materials unless noted otherwise.

### 3.03 ROUGH HARDWARE

- A. General: Nails, spikes, screws, fabricated sheet metal anchors, ties, hangers and any other materials shown or required for the attachment of wood to concrete and wood to steel and wood to wood shall be furnished and installed as part of this work.
- B. Framing Nailing: All framing nailing shall conform to minimum requirements of the Building Code, and with details shown on the drawing.
- C. Bolts, Lag Screws and Washers:
1. Bolts in wood shall be machine bolts unless otherwise noted and shall be of such length that the bearing length of the threads does not exceed  $\frac{1}{4}$  of the full bearing length in the member holding the threads. Bolt holes in wood shall be  $\frac{1}{32}$ " oversized. Bolt holes for sill plates may be  $\frac{1}{16}$ " maximum oversize. Holes in steel shall be  $\frac{1}{16}$ " oversize. See Section 3.1 for anchor bolts at sill plates and ledgers.
  2. Provide square plate or malleable iron washer and nut at head where bearing is against wood; cut washer under nut where it is against steel. Washer will not be required under head of carriage bolts. Provide malleable iron washers where exposed.
  3. All nuts shall be tightened when placed and retightened at completion of the job or immediately before closing with final construction.
  4. Lag screws shall be screwed (not driven) into place. Drill pilot hole to 70% of shank diameter. Drill clearance hole to full shank diameter and depth of unthreaded screw length.
- D. Wood Screws: Minimum penetration is 10 diameters unless noted otherwise. Where fastening hardwood timber species or where wood tends to split, provide pilot hole 70% of screw shank diameter.
- E. Proprietary Fasteners and Hardware: Install per manufacturer's published installation instructions (MPII) and code approval report (e.g. ICC ESR, IAPMO ER, etc). Provide MAX quantity, size, and length of fastener at hardware (i.e. joist hangers, framing, clips, etc) unless otherwise noted per plan.

### 3.04 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

- A. Coordinate installation of wood decking, metal-web wood joists, glued-laminated wood construction, shop-fabricated wood trusses, and wood I- joists.
- B. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members. Fasten curbs corner-to-corner and to rafters with framing connectors configured for this application.
- C. Blocking:
  - 1. Provide fire blocking at locations and spacing's as required by CBC Chapter 7. Locate other blocking, supplementary framing, backing plates and bracing to facilitate installation of finish materials, fixtures, equipment, services, accessories, and trim requiring attachment and support.
  - 2. Solid block joists and rafters over all supports with blocking of the same size and material as the joist or rafter.
- D. Furring:
  - 1. Nominal 1 inch x 3 inch minimum, continuous and spaced at 16 inches on center, maximum.
  - 2. Install plumb, rigid, and level. Shim where necessary to provide a true, even plane suitable to receive the finish required.
  - 3. Attach to concrete and masonry as shown in the contract drawings.
- E. Install miscellaneous metal angles, bolts, and other items; secure into formwork where embedded in concrete.
- F. Install accessory items not otherwise set under other sections; after completion of painting and other finishing work; in locations shown or directed by the Architect. Set items plumb, level, and secure using appropriate fastening as applicable.

### **3.05 FIELD APPLIED WOOD TREATMENT**

- A. Field treat all end cuts and holes in preservative treated materials per PART 2.
- B. Apply two brush coats; or full-immersion dip not less than 15 minutes; or as required to thoroughly saturate all surfaces after cutting.
- C. Air dry 2-hours minimum before installation.

### **3.06 TOLERANCES**

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Variation from Plane (Other than Floors): 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum. Provide framed substrates meeting requirements for application of finishes specified in other sections.



- D. Exposed surfaces shall be free from dents and tool marks, unsanded rough or torn faces and corners, and other defects.

### 3.07 FIELD QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform the following tests and submit reports as specified in Division 01:
  - 1. Moisture content of all lumber at time of close-in.
  - 2. Periodic special inspection of nailing, bolting, and other fastening within the seismic-force-resisting system including shear walls, wood diaphragms, etc. per CBC Section 1705A.13.2.

### 3.08 ADJUSTING

- A. Replace all defective work at Contractor's expense.
- B. Replace defective or damaged work with conforming work.
- C. Correct defects using means that will not injure the materials.
- D. Replace defective or damaged work which cannot be corrected in the field with new work, or return defective items to the shop for repair.
- E. Repair or replace framing lumber sagged, twisted or warped due to shrinkage from excessive moisture content at time of installation, or from other causes.
- F. Adjust to meet specified tolerances.
- G. Architect/Engineer shall review all proposals for the repair or replacement of damaged, defective, or missing work.
- H. Pay expenses incurred by Owner for Architect/Engineer's costs for (re-)design and obtaining approvals of Authorities Having Jurisdiction (AHJ) necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.
- I. Pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.

### 3.09 CLEANING AND PROTECTION

- A. Clean all surfaces upon completion of erection, leave free of grime and dirt. Remove unused materials, tools, equipment, and debris from the premises and leave surfaces broomed clean.
- B. Waste Disposal: Comply with the requirements of pertinent sections of Division 01 specifying cleaning and disposal.
  - 1. Comply with applicable regulations.
  - 2. Do not burn scrap on project site.
  - 3. Do not burn scraps that have been pressure treated.
  - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.

- C. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- D. Prevent sawdust and wood shavings from entering the storm drainage system.
- E. Protect work from damage by subsequent operations.

**END OF SECTION**

**SECTION 07 0150.91**  
**ROOFING REPAIR**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Maintenance roofing work including but not limited to:
  - 1. Flashing Installation at new penetrations.
  - 2. All flashings to consist of one ply of Polyester-Fiberglass-Polyester base sheet set in mastic covered by an additional layer of modified bitumen membrane.
- B. Provide all labor, equipment, and materials to maintain and protect the existing roof system.

**1.02 RELATED SECTIONS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 07 6200- Sheet Metal Flashing and Trim: Sheet metal flashing and trim.
- C. Pertinent sections of other Divisions specifying work penetrating or located on roof.

**1.03 REFERENCE STANDARDS**

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- B. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code, "CAL-Green".

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets documenting conformance with existing roof membrane.
- C. CAL-GREEN Submittals: Product Data - VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
- D. Certificates: Certify that products of this section meet or exceed specified requirements.
- E. Manufacturer's Field Reports: Indicate deviations or deficiencies observed during site visits, record method of resolution.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer.
  - 1. Installer's Field Supervision: Require Installer to maintain a full-time Supervisor/Foreman on job site during all phases of bituminous sheet roofing work and at any time roofing work is in progress, proper supervision of workmen shall be maintained. A copy of the specification shall be in the possession of the Supervisor/Foremen and on the roof at all times.

- C. Respond immediately to correction of roof leakage during construction. If the contractor does not respond within 24 hours, the Owner has the right to hire a qualified contractor and backcharge the original contractor.

#### **1.06 PRE-INSTALLATION MEETING**

- A. Convene two weeks before starting work of this section. Meet at Project site with Installer, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in the around roofing that must precede or follow roofing work (including mechanical work if any), Architect/Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, test agencies, and governing authorities. Objectives to include:
  - 1. Review methods and procedures related to roofing work.
  - 2. Review structural loading limitations of deck.
  - 3. Review roofing systems requirements (drawings, specifications, and other contract documents).
  - 4. Review required submittals, both completed and yet to be completed.
  - 5. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 6. Review required inspection, testing, certifying, and material usage accounting procedures.
  - 7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including provision of temporary roofing over occupied spaces.
  - 8. Record discussion of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
  - 9. Review notification procedures for weather or non-working days.

#### **1.07 DELIVERY, STORAGE, AND PROTECTION**

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store and handle roofing materials in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).
- C. Do not leave unused rolled goods on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- D. Secure all material and equipment on the job site. If material or equipment is stored on the roof, the contractor shall ensure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

#### **1.08 PROJECT CONDITIONS**

- A. Coordinate roof repair installation with size, location and installation of roof mounted work.

- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

#### **1.09 ENVIRONMENTAL REQUIREMENTS**

- A. Weather Condition Limitations: Do not apply materials during inclement weather or when a 40% chance of precipitation is expected.
- B. Materials shall be stored at room temperature until immediately prior to application when the ambient temperature is 40°F or below. Discontinue the application if the material can not be stored at a temperature which permits even distribution during application.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

#### **1.10 WARRANTY**

- A. Correct defective Work within a one year period after Date of Substantial Completion.
- B. Provide one year manufacturer warranty for roof repair.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Make roof weathertight and watertight. All drainage to flow off roof, do not permit standing water.

#### **2.02 MANUFACTURERS**

- A. Provide products compatible with existing roofing.

#### **2.03 MATERIALS**

- A. Modified Flashing Ply: ASTM D-6162 Type III Grade G , 135 mil SIS and SB (Styrene-Isoprene-Styrene and Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane reinforced with a dual fiberglass scrim and polyester mat.
- B. Asphalt Primer: V.O.C. compliant, ASTM D-41.
- C. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.
- D. Reinforcing Fabric: Fiberglass Mesh.
- E. Base Flashing Ply: ASTM D-4601 Type II, one ply of Polyester-Fiberglass-Polyester, as recommended and furnished by the membrane manufacturer.
- F. Deck Sheathing: Perlite board, ASTM C 728; 1/2 inch thick, as manufactured by Manville, Celotex.

#### **2.04 ACCESSORIES**

- A. Nails and Fasteners: Galvanized steel except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel.
- B. Metal Discs: Flat discs or caps of zinc-coated sheet metal not lighter than 28 gauge and not less than 1-inch in diameter. Discs shall be formed to prevent dishing. Bent or cup-shaped caps are not acceptable.

- C. Accessory Materials: Other materials not specifically indicated but required to achieve the results specified; commercial quality. Types recommended by manufacturer to suit conditions.
- D. Sealant: Compatible material of types specified in Section 07 9200.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrate surfaces to receive roofing system and associated work and conditions under which roofing will be installed. Do not proceed with roofing repairs until unsatisfactory conditions have been corrected in a manner acceptable to Roof System Manufacturer and Installer.
- B. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof repairs.
- C. Verify deck surfaces are dry and free of snow or ice.

#### **3.02 WOOD DECK PREPARATION**

- A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.
- B. Seal joints of plywood with tape.
- C. Confirm dry deck by moisture meter with 12 percent moisture maximum.

#### **3.03 INSTALLATION**

- A. Prepare all penetrations to be flashed and where shown on the drawings.
- B. All plies will be adhered with the following:
  - 1. With mastic. The base flashing and the modified membrane will be used as the flashing and nailed off 8 inches O.C. at all vertical surfaces.
- C. The entire sheet of the base flashing and the flashing membrane must be solidly adhered to the substrate. All base flashings shall be set in mastic and covered by an additional layer of modified bitumen membrane.
- D. Seal all vertical laps of flashing membrane with a three-course application of Flashing Bond and fiberglass mesh and aluminize.
- E. Seal junction of flashing membrane and roof with a three-course application of Flashing Bond and mesh.
- F. Install all work in accordance with manufacturer's instructions.

#### **3.04 INTERFACE WITH OTHER WORK**

- A. Coordinate with roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with the roofing work as specified in other sections to avoid conflict or omission in waterproofing systems and to provide watertight installation.

#### **3.05 FIELD QUALITY CONTROL**

- A. At completion of roofing installation and associated work, meet with 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 parting attending.
- C. Repair or replace (as required) deteriorated or defective work found at time above inspection to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- D. The Contractor is to notify the Owner upon completion of corrections.
- E. Following the final inspection, acceptance will be made in writing by the material manufacturer.

**3.06 CLEANING and PROTECTION**

- A. Clean roof and surrounding surfaces. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by bitumen or other source of soiling caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.
- D. Protect installed work from subsequent construction operations.
- E. Do not permit traffic over unprotected roof surface.

**END OF SECTION**

**SECTION 07 2100**  
**BOARD AND BATT [BUILDING] INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Batt insulation and vapor retarder in interior and exterior wall, ceiling, roof, and floor construction.
- B. Insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.
- D. Division 23 - Mechanical, Duct and Pipe Insulation.

**1.03 REFERENCE STANDARDS**

- A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.
- C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
- D. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code.
- E. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- F. Manufacturer's recommendations.

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. CAL-GREEN Submittals:
  - 1. Product Data - VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
  - 2. Certify compliance with California Referenced Standards Code as referenced in Article PERFORMANCE REQUIREMENTS.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- E. Schedule of installation methods for each and every system and condition.
- F. Samples of mechanical supports and fasteners.



### 1.05 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

### 1.06 SEQUENCING

- A. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this section.

### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Mark materials on face of package, with manufacturer's name, thickness, and insulation "R" value.

## PART 2 PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Insulating Material Standards: All insulation materials must comply with the California Referenced Standards Code, California Code of Regulations, Title 24, Part 12 / Chapter 12-13 Standards for Insulating Material.
  - 1. Foam Board Insulation products shall be manufactured without HFC134a blowing agents.
- C. Roof and wall insulation to provide a complete insulation envelope surrounding all conditioned spaces, as indicated elsewhere in the Contract Documents, and as listed below.

### 2.02 APPLICATIONS

- A. Insulation in Metal Framed Exterior Walls: Batt insulation with integral vapor retarder.
  - 1. Metal Framed Wall Insulation: Minimum R-19 fiberglass batts with integral vapor barrier, fastened to wood studs, and greater thicknesses as required to fill framing cavity with insulation batt equal to full depth of framing member, taped to metal studs.
- B. Insulation in Interior Framed Walls: Unfaced Batt Insulation with no vapor retarder to full depth of framing member, at all wall locations.

### 2.03 BATT INSULATION MATERIALS

- A. Glass Fiber Batt Insulation: ASTM C 665; flexible preformed glass fiber batt; friction fit, sized to fit between framing elements, conforming to the following:
  - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
  - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
  - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
  - 4. Formaldehyde Content: Zero.
  - 5. Thermal Resistance: R value as indicated.
  - 6. Facing: FSK (Foil-Scrim Kraft), one side. Exception: Paper facing may be provided in locations where the insulation is in "substantial contact" with the wall finish as described in exceptions noted in CBC 719.2.1.
  - 7. Maximum 0.50 perm rating, ASTM E 96.
  - 8. Manufacturers:
    - a. Johns Manville International, Inc: [www.jm.com](http://www.jm.com).
    - b. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).

- c. Owens Corning Corp: [www.owenscorning.com](http://www.owenscorning.com).
- d. Substitutions: See Section 01 6000 - Product Requirements.

- B. Acoustic Batt (Sound Retardant) Insulation:
  - 1. Same as Batt Insulation, unfaced.

#### **2.04 OTHER INSULATION**

- A. Foamed-in-place Plastic Insulation: Polyurethane Foam Sealant, Flame Spread 20 / Smoke Developed 20, when tested in accordance with ASTM E 84.
  - 1. Manufacturers:
    - a. Dow Chemical Co.; Great Stuff: [www.itsgreatstuff.dow.com](http://www.itsgreatstuff.dow.com). UL Listed R 13655.
    - b. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.05 ACCESSORIES**

- A. Attachment clips as recommended by the manufacturer in writing.
- B. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
- C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- D. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.
- E. Adhesive: Type recommended by insulation manufacturer for application.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify that all framing inspections are complete and that required corrections have been made before installing insulation.

#### **3.02 INSTALLATION - GENERAL**

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in walls, roof and ceiling spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.
- D. Small gaps and voids which are not otherwise insulatable:
  - 1. Either sprayed foam type plastic insulation or mineral wool, as recommended by the Contractor and approved by the Architect.
  - 2. Provide bond breaking material between foam and adjacent materials wherever possible.
- E. Install with factory applied vapor retarder membrane facing warm side of building spaces.

#### **3.03 BATT INSTALLATION**

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall, roof, and ceiling spaces without gaps or voids. Do not compress insulation.

- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Secure vapor barrier facing to framing along edges and at ends of batt at all applications. At horizontal applications additionally provide guy wire or netting to support insulation without sags.
- G. Batts: Attach by either method.
  - 1. Install as a single length between structural members or fold vapor barriers together and staple or tape at intermediate end joints.
  - 2. Staple or nail facing flanges in place at maximum 6 inches on center.
- H. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- I. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over member face.
- J. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
- K. Tape seal tears or cuts in vapor retarder.
- L. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.
- M. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

#### **3.04 PROTECTION**

- A. Repair holes or tears with adhesive tape immediately before application of finish.
- B. Do not permit installed insulation to become wet or damaged prior to its concealment.

**END OF SECTION**

**SECTION 07 3113**  
**ASPHALT SHINGLES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Asphalt shingle roofing.
- B. Flexible sheet membranes for eave protection, underlayment, and valley protection.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 -Sustainable Design Requirements.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Associated metal flashings and accessories.
- D. Pertinent sections of Divisions 23 and 26 specifying Mechanical and Electrical work projecting through roof.

**1.03 REFERENCE STANDARDS**

- A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.
- B. ASTM D3161/D3161M - Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method); 2014.
- C. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules; 2010a.
- D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.
- F. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2011.
- G. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- H. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- I. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments; 2012.
- J. NRCA (RM) - The NRCA Roofing Manual; 2017.
- K. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
- L. UL (DIR) - Online Certifications Directory; current listings at [database.ul.com](http://database.ul.com).

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

- C. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
- D. Product Data – VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
- E. Product Test Reports: For roof materials, indicating that roof materials comply with Solar Reflectance Index requirement and demonstrate Cool Roof Rating Council (CRRRC) listing.
- F. Shop Drawings: For metal flashings, indicate specially configured metal flashings.
- G. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.
- H. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.
- I. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- J. Installer Qualifications, including Manufacturer approval.
- K. Sample Warranty meeting specified requirements.
- L. Final Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- M. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Shingles: 100 sq ft of each type and color.

#### **1.05 QUALITY ASSURANCE**

- A. Products are Required to Comply with Fire Resistance Criteria: UL (DIR) listed and labeled.

#### **1.06 MOCK-UP**

- A. Provide mock-up of 10 sq ft, including underlayment, shingles, eave protection membrane, and associated flashings.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

#### **1.07 FIELD CONDITIONS**

- A. Do not install shingles or eave protection membrane when surface temperatures are below 45 degrees F.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a ten (10) year period after Date of Substantial Completion.
- C. Provide Forty (40) year lifetime manufacturer's warranty.
- D. Provide ten (10) year manufacturer's warranty for coverage against black streaks caused by algae.
- E. Provide fifteen (15) year manufacturer's warranty for wind damage.

### 1.09 EXTRA MATERIALS

- A. See Section 01 6000 - Product Requirements, for additional provisions.
- B. Provide 10 sq ft of extra shingles of each color specified.

## PART 2 PRODUCTS

### 2.01 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Energy Performance: Provide roofing system with initial Solar Reflectance not less than 0.70 when tested according to ASTM D 1549 and Thermal Emittance not less than 0.75 when tested according to ASTM D 1371 and listed on Cool Roof Rating Council's CRRC-1.
  - 1. Energy Performance: ENERGY STAR and Cool Roof Rating Council (CRRC) rated.
- C. UL Listed and Certified.

### 2.02 MANUFACTURERS

- A. Asphalt Shingles:
  - 1. GAF; Product Timberline AH with StainGuard Plus: [www.gaf.com](http://www.gaf.com). UL listing R 21.
  - 2. Or equivalent product from one of the following:
    - a. Certainteed Corp., [www.certainteed.com](http://www.certainteed.com), "Landmark PRO", UL Listing R684.
    - b. Owens Corning Corp; Product Duration Premium. UL listing R2453, [www.owenscorning.com](http://www.owenscorning.com)
  - 3. Substitutions: See Section 01 6000 - Product Requirements.

### 2.03 ASPHALT SHINGLES

- A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462.
  - 1. Fire Resistance: Class A, complying with ASTM E108.
  - 2. Wind Resistance: Class A, when tested in accordance with ASTM D3161.
  - 3. Warranted Wind Speed: ASCE calculated wind pressures.
  - 4. Algae Resistant.
  - 5. Self-sealing type.
  - 6. Style: Square.
  - 7. Color: As selected by Architect.

### 2.04 FINISHES

- A. Asphalt Shingle Color(s) as selected by Architect from:
  - 1. Manufacturer's full range of standard colors.

### 2.05 SHEET MATERIALS

- A. Eave Protection Membrane: Self-adhering polymer-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil total thickness; with strippable treated release paper and polyethylene sheet top surface.
  - 1. Products:
    - a. As approved and warranted by shingle manufacturer for 50 year warranty.
    - b. Substitutions: See Section 01 6000 - Product Requirements.

- B. Underlayment: Self-adhering rubber-modified asphalt sheet complying with ASTM D1970/D1970M; 22 mil total thickness; with strippable release film and woven polypropylene sheet top surface.
  - 1. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
  - 2. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
  - 3. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
  - 4. Water Vapor Permeance: 0.067 perm, when tested in accordance with ASTM E96/E96M, Procedure A (desiccant method).
  - 5. Functional Temperature Range: Minus 70 degrees F to 212 degrees F.
  - 6. Products:
    - a. As approved and warranted by shingle manufacturer for 50 year warranty.
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## 2.06 ACCESSORIES

- A. Nails: Standard round wire shingle type, of aluminum, 12 gage, 0.105 inch shank diameter, 7/16 inch head diameter, and conforming to ASTM F1667; of sufficient length to penetrate through roof sheathing or minimum of 3/4 inch into roof sheathing or decking. Staples will be rejected.
- B. Staples: Not permitted.
- C. Plastic Cement: ASTM D4586/D4586M, asphalt roof cement.
  - 1. Garland Roofing Co. Inc., Flashing Bond: [www.garlandco.com](http://www.garlandco.com).
  - 2. Substitutions: See Section 01 6000 - Product Requirements.
- D. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of toxic solvents.

## 2.07 METAL FLASHINGS

- A. Metal Flashings: Provide sheet metal eave edge, gable edge, ridge, dormer flashing, penetrations, and other flashing indicated, and other flashing indicated and as specified in related sections, as required by roofing material manufacturers and referenced standards. Coordinate work of this section with related sections. Provide complete systems without conflict or omission.
  - 1. Form flashings to profiles indicated on drawings.
  - 2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
  - 3. Hem exposed edges of flashings minimum 1/4 inch on underside.
  - 4. Coat concealed surfaces of flashings with bituminous paint.
- B. Sheet Metal: Type(s) specified in Section 07 6200.
- C. Bituminous Paint: Acid and alkali resistant type; black color.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.
- B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- C. Verify roof openings are correctly framed.
- D. Verify deck surfaces are dry, free of ridges, warps, or voids.

### **3.02 INTERFACE WITH OTHER WORK**

- A. Coordinate with roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices as specified in other sections. Avoid conflict or omission in waterproofing systems and provide watertight installation.

### **3.03 PREPARATION**

- A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.
- B. At areas where underlayment or eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.
- C. Broom clean deck surfaces before installing underlayment or eave protection.
- D. Install eave edge flashings tight with fascia boards, weather lap joints 2 inches and seal with plastic cement, and secure flange with nails spaced \_\_\_\_ inches on center.

### **3.04 INSTALLATION - EAVE PROTECTION MEMBRANE**

- A. Install eave protection membrane from eave edge to minimum 4 ft up-slope beyond interior face of exterior wall.
- B. Install eave protection membrane in accordance with shingle manufacturer's instructions.

### **3.05 INSTALLATION - UNDERLAYMENT**

- A. At Roof Slopes Less Than 4:12 : Install two layers of underlayment over entire roof area, with ends and edges weather lapped minimum 6 inches. Stagger end laps of each consecutive layer. Nail in place.
- B. Underlayment At Roof Slopes Greater Than 4:12: Install underlayment perpendicular to slope of roof, with ends and edges weather lapped minimum 4 inches, stagger end laps of each consecutive layer, nail in place, and weather lap minimum 4 inches over eave protection.
- C. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.

### **3.06 INSTALLATION - VALLEY PROTECTION**

- A. Install eave protection membranes in valleys in accordance with manufacturer's instructions.
- B. Weather lap joints minimum 2 inches.
- C. Nail in place minimum 18 inches on center, 1 inch from edges.
- D. At Exposed Valleys: Install one layer of sheet metal flashing, minimum 24 inches wide, centered over open valley and crimped to guide water. Weather lap joints minimum 2 inch wide band of lap cement along each edge of first, press membrane into cement, and nail in place minimum 18 inches on center, 1 inch from edges.

### **3.07 INSTALLATION - METAL FLASHING AND ACCESSORIES**

- A. Install flashings in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Weather lap joints minimum 3 inches and seal weather tight with plastic cement.
- C. Secure in place with nails at 3 inches on center, and conceal fastenings.



- D. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

### **3.08 INSTALLATION - SHINGLES**

- A. Install shingles in accordance with manufacturer's instructions manufacturer's instructions and NRCA (RM) applicable requirements.
  - 1. Fasten strip shingles using 6 nails per strip, or as required by code, whichever is greater.
  - 2. Fasten strip shingles with minimum 4 asphalt mastic seal tabs 1 inch diameter by 1/8 inch thick per shingle, and as recommended by manufacturer for high wind exposure installation.
- B. Place shingles in straight coursing pattern with 5-3/4 inch weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
- C. Project first course of shingles 3/4 inch beyond fascia boards.
- D. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
- E. Coordinate shingle installation with sheet metal valley flashings.
- F. Cap hips with individual shingles, maintaining 5 inch weather exposure, and place to avoid exposed nails.
- G. Coordinate installation of roof mounted components or work projecting through roof with weather-tight placement of counterflashings.
- H. Complete installation to provide weather tight service.

### **3.09 PROTECTION**

- A. Do not permit traffic over finished roof surface.

**END OF SECTION**

**SECTION 07 6200**  
**SHEET METAL FLASHING AND TRIM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, scuppers, and other items indicated in Schedule and as follows:
  - 1. Edge strip and flashing.
  - 2. Counterflashings for roof accessories, roof mounted equipment, vent stacks and similar items.
  - 3. Reglets and accessories.
  - 4. Plaster stops, terminations and miscellaneous custom shapes not otherwise provided by related section specifying plaster cladding.
  - 5. Attic and soffit vents of perforated sheet metal.
- B. Sealants for joints within sheet metal fabrications.
- C. Tape Sealant for sheet metal and flashing applications.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Section 07 3113 - Asphalt Shingles: Non-metallic flashings associated with shingle roofing.
- D. Section 07 7100 - Roof Specialties: Manufactured copings, flashings, and expansion joint covers.
- E. Section 07 7200 - Roof Accessories: Manufactured metal roof curbs.
- F. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.
- G. Division 23, Mechanical: Sheet metal mechanical work.

**1.03 REFERENCE STANDARDS**

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM A792 Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process
- D. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- F. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- G. ASTM B486 Paste Solder
- H. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

- I. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.
- J. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2013a.
- K. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- L. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- M. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- N. FS QQ-L-201 Specification for Lead Sheet
- O. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
- P. WH Warnock Hersey International, Inc. Middleton, WI.
- Q. FM Loss Prevention Data Sheet.
- R. NRCA National Roofing Contractors Association - Roofing Manual.
- S. Manufacturer's recommendations and specifications.

#### **1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
  - 1. Indicate type, gauge and finish of metal.
- C. Product data: Provide manufacturer's specification data sheets for each product. Demonstrate compliance with specified attributes:
  - 1. Submit color chart for prefinished materials.
  - 2. Metal material characteristics and installation recommendations.
- D. CAL-GREEN Submittals: Product Data - VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
- E. Certification:
  - 1. Submit certification that metal and fastening system furnished is Tested and Approved by Factory Mutual for 1-90 Wind Up-Lift Requirements.
- F. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.
- G. Proof of fabricator and installer qualifications.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements , except as otherwise indicated.
  - 1. Factory Mutual Approval Standard 4435.

- B. Contractor's Warranty: The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be water-tight and secure for a period of five years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that could cause discoloration or staining.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.

#### **2.02 SHEET MATERIALS**

- A. Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, minimum thickness 24 gauge and greater as required by referenced standards for specific applications indicated.
- B. Aluminum: ASTM B 209 (ASTM B 209M); Alloy and temper as recommended by fabricator for applications indicated, 0.40-inch thick, typical, unless SMACNA standard permits thinner gauge for specific application.
  - 1. Match finish of storefront / curtain wall assembly specified in related section.
  - 2. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; pretreated metal with two-coat system including primer and color coat with at least 70 percent PVDF coating.
  - 3. Color: As selected by Architect from manufacturer's full colors, including metallics.
  - 4. Coating thickness: 0.0276-inch minimum.
- C. Stainless Steel: ASTM A666, Type 304 alloy, soft temper, 28 gage, (0.0156 inch) thick; smooth No. 4 - Brushed finish.
- D. Stainless Steel: ASTM A666, Type 316 alloy, soft temper, 28 gage, (0.0156 inch) thick; smooth No. 4 - Brushed finish.

#### **2.03 UTILITY WALL PENETRATION FLASHINGS**

- A. Prefabricated Facility Services Utility Penetration Flashings, sizes and profiles required to suit conditions.
- B. Manufacturer: Quickflash Weatherproofing Products, Inc., 4129 Wagon Trail Avenue, Las Vegas, Nevada 89118. Phone (702) 614-6100. Fax (702) 614-4090. Website [www.quickflashproducts.com](http://www.quickflashproducts.com).
- C. Plumbing Flashing Panels:
  - 1. Panel: Combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE).
    - a. HDPE, Specific Gravity, ASTM D 1505: 0.953 g/cm<sup>3</sup>.

- b. HDPE, Tensile Strength at Yield, ASTM D 638: 3,100 psi.
- c. LDPE, Specific Gravity, ASTM D 792: 0.917 g/cm<sup>3</sup>.
- d. LDPE, Tensile Strength at Yield, ASTM D 638: 1,300 psi.
- 2. Weatherproof Seal: Thermoplastic elastomer.
  - a. Hardness, ASTM D 2240, Shore A, 10 Seconds: 46.
  - b. Specific Gravity, ASTM D 792: 1.05 g/cm<sup>3</sup>.
  - c. Tensile Strength, ASTM D 412: 490 psi.
- D. Electrical Flashing Panels:
  - 1. Material: Thermoplastic elastomer.
    - a. Hardness, ASTM D 2240, Shore A, 10 Seconds: 93.
    - b. Specific Gravity, ASTM D 792: 1.05 g/cm<sup>3</sup>.
    - c. Tensile Strength, ASTM D 412: 1,300 psi.

#### 2.04 FABRICATION - GENERAL

- A. Fabricate in accordance with referenced standards. Form sections true to shape, accurate in size, square, and free from distortion or defects. Form pieces as recommended by SMACNA standard for conditions required.
  - 1. Provide reinforcements and supports as required for secure anchorage.
  - 2. Make joints rigid. Seams mechanically strong and soldered or sealed to make watertight
  - 3. Fabricate corners in one piece with legs extending 30-inches each way to field joint. Lap, rivet, and solder or seal corner seams watertight.
  - 4. Turn up "end dam" flanges at ends of opening sill flashing pieces, lap with wall flashing and membranes to shed water.
  - 5. Fabricate cleats of same material as sheet, minimum 3/4 inches wide, interlockable with sheet.
  - 6. Hem exposed edges on underside 1/2 inch; miter and seam corners.
  - 7. Solvent clean all sheet metal. Coat surfaces to be in contact with roofing or otherwise concealed with specified asphaltic paint; 0.015-inch minimum uniform thickness.
- B. Fabricate cleats of same material as sheet, 1 gauge heavier, minimum 2 inches wide, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Machine-roll flashing elements and joinery required to be curved or radiused. Do not field bend or "walk-down". Provide true curves and joinery utilizing "Pittsburgh lock" construction, minimizing joints. Segmented fabrication is not acceptable unless specifically noted and dimensioned on drawings.
- E. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- F. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- I. Perforate sheet metal where indicated for attic and soffit ventilation: 0.125 inch diameter holes, 0.1875 inch staggered spacing, minimum 40 percent clear area, 24 gauge minimum and greater as available from McNichols Metal, [www.mcnichols.com](http://www.mcnichols.com) or equal.

## 2.05 ROOF-RELATED SHEET METAL AND FLASHINGS

- A. Roof-Related Sheet Metal and Flashings: As indicated, as specified in related sections, as required by roofing material manufacturers and referenced standards. Coordinate work of this section with related sections. Provide complete systems without conflict or omission.

## 2.06 RAIN DRAINAGE FABRICATION

- A. Gutters: Profile as indicated. 24 gauge minimum, and heavier gauge as recommended by SMACNA Table 1-5 for size and girth indicated.
  - 1. Expansion joints: Lap type; closed ends with cap over flanged tops of gutter ends.
- B. Sheet Metal Downspouts: Profile and size indicated, provide above first floor elevations only, i.e. from higher roof to lower roof. Do not provided from roof to grade. Use steel pipe downspouts from roof to grade.
- C. Steel Pipe Downspouts: Type specified in Section 05 5000.
- D. Accessories: Profiled to suit gutters and downspouts.
  - 1. End caps, rain diverters, gutter straps support brackets, joint fasteners: Sized to suit gutters, of matching thickness.
  - 2. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
  - 3. Gutter Supports: Straps. Fabricate from material of double thickness of gutter fabrication, minimum.
  - 4. Downspout Supports: Straps. Fabricate from material of double thickness of gutter fabrication, minimum
  - 5. Gutter Outlet Strainers: Stainless steel; Woven wire mesh type, #10 gauge, No.4 mesh minimum.
- E. Seal prefinished metal joints. Solder other joints.

## 2.07 ACCESSORIES

- A. Reinforcement Metals:
  - 1. Typical: Stainless steel.
  - 2. For aluminum work: Aluminum.
  - 3. For copper work: Copper or Stainless Steel.
- B. Fasteners:
  - 1. General: Corrosion resistant screw fasteners with neoprene washers as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
  - 2. Fastening shall conform to Factory Mutual 1-90 requirements or as stated on section details, whichever is more stringent.
  - 3. Screws, bolts, washers, drive-ins.
    - a. For aluminum work: Stainless steel, aluminum, or zinc-aluminum alloy.
    - b. For galvanized steel work: Galvanized steel or cadmium plated steel.
    - c. For stainless steel work or dissimilar metals: Stainless steel.
    - d. For Type 316 stainless steel work or dissimilar metals: Type 316 stainless steel.
    - e. For zinc alloy work: Steel, hot dip galvanized per ASTM A153, or stainless steel or aluminum.
    - f. For copper work: copper.
- C. Underlayment: Organic roofing felt, Type II ("No. 30").
- D. Primer: Galvanized iron type.

1. Product: Rust-Oleum 7400 System, Modified Alkyd Zinc Primer, <340 g/l VOC:  
[www.rustoleum.com](http://www.rustoleum.com).
  2. Substitutions: Section 01 6000.
- E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant, complying with requirements of Section 07 9200, and recommended by manufacturer for substrates to be sealed.
- F. Sealant to be Exposed in Completed Work: Elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent, complying with requirements of Section 07 9200, and recommended by manufacturer for substrates to be sealed; color selected by Architect.
- G. Self-Adhering Flashing Membrane: Grace Ultra™ Butyl Sheet Underlayment, High Temperature Type, manufactured by GCP Applied Technologies; tel: (866) 333-3726; web: [www.gcpat.com](http://www.gcpat.com).
1. Description: Sheet material composed of 100% butyl rubber adhesive backed by a layer of high density cross laminated polyethylene film.
  2. Physical and Performance Properties:
    - a. Thickness: 30 mils (0.76 mm).
    - b. Roll Width: 36 inches (914 mm).
    - c. Tensile Strength, Membrane: 250 psi (1720 kN/m<sup>2</sup>) per ASTM D 412 (Die C Modified).
    - d. Elongation, Membrane: 250% per ASTM D 412 (Die C Modified).
    - e. Low Temperature Flexibility: Unaffected at -20 deg F (-29 deg C) ASTM D 1970.
    - f. Adhesion to Plywood: 3.0 lbs/in. width (525 N/m) per ASTM D 903.
    - g. Permeance (Maximum): 0.05 Perms (2.9 ng/m<sup>2</sup>s Pa) per ASTM E 96.
    - h. Material Weight Installed (Maximum): 0.22 lb/ft<sup>2</sup> (1.1 kg/m<sup>2</sup>) per ASTM D 461.
- H. Sealer Tape: One of the following:
1. Medium Density Closed Cell EPDM or rubber blend tape single-coated with acrylic adhesive, for use in sheet metal and flashing applications.
    - a. Width and Thickness: As required for snug fit under low compression to exclude moisture.
    - b. Tensile Strength, ASTM D 412: 65 PSI.
    - c. Pres-On; P9100, [www.pres-on.com](http://www.pres-on.com).
    - d. 3M
    - e. Argent; [www.argent-international.com](http://www.argent-international.com).
  2. Polyisobutylene cross-linked butyl sealer tape specifically manufactured for lap sealing and joints subject to shear, Tremco 440, or equal.
  3. Substitutions: See Section 01 6000 - Product Requirements.
- I. Plastic Cement: 1, Type I.
- J. Flux: FS O-F-506.
- K. Solder: ASTM B32; Sn50 (50/50) type. Compatible with materials joined.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

- C. Beginning of installation means acceptance of existing conditions.
- D. Field measure site conditions prior to fabricating work.

### 3.02 PREPARATION

- A. Install starter strips, edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

### 3.03 INSTALLATION

- A. Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA Architectural Sheet Metal Manual.
  - 1. Anchor units of work securely in place by methods indicated, providing for thermal expansion of units; conceal fasteners where possible, and set units true to line and level in locations indicated.
  - 2. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction. Conform to referenced standards. Make metal joints watertight.
- C. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual 1-90 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.
- D. Underlayment: Where sheet metal installation occurs on cementitious or wood substrates, install roofing felt covered with slip sheet direct to substrate, do not permit sheet metal installation directly to concrete or wood.
- E. Coordinate sheet metal installation with roofing underlayment and air barrier and water-resistive barriers specified in related sections.
- F. All accessories or other items essential to the completeness of sheet metal installation and water tight envelope of the building, whether specifically indicated or not, shall be provided.
- G. Flashing: Joints at 10-foot maximum spacing and at 2-1/2-feet from corners. Butt joints with 3/16-inch space centered over matching 8-inch long backing plate with sealer tape in laps.
- H. Flanged flashings and roof accessories: Set on continuous sealer tape. Nail flanges through sealer tape and at 3-inch maximum spacing.
- I. Isolate metal from dissimilar metal with 2 coats of specified asphaltic paint, sealer tape or other approved coating, specifically made to stop electrolytic action. Use only stainless steel fasteners to connect isolated dissimilar metals.
- J. Joints, fastenings, reinforcements and supports: Sized and located as required to preclude distortion or displacement due to thermal expansion and contraction. Conceal fastenings wherever possible.
- K. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- L. Flexible Flashing Installation: Install at closure flanges, under metal copings, caps and platforms; fully adhered, free of voids, blisters and buckling.
  - 1. Prime substrates as recommended by flexible flashing manufacturer, allow to dry.



2. Install flexible flashings in maximum feasible lengths to minimize lap joints.
  3. Peel release paper from roll to expose rubberized asphalt and position flashing to center over joint location before applying. Move along opening or joint, being careful to put flashing as evenly as possible over the opening. Avoid fishmouths.
  4. Press flashing firmly into place and roll using resilient roller with heavy hand pressure . Ensure continuous and intimate contact with substrate. Perform hand pull test to verify adhesion.
  5. If wrinkles develop, carefully cut out affected area and replace as outlined above.
  6. Minimize exposure time to that period recommended by the manufacturer.
- M. Apply plastic cement compound between metal flashings and felt flashings.
- N. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- O. Seal prefinished metal joints watertight.
- P. Solder other metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.
- Q. Secure gutters and downspouts in place with concealed fasteners.
1. Gutter support straps: Nail or screw into solid framing or blocking, 16 d minimum. Provide straps at 32 inches on center minimum, align with roof framing members where occurs.
  2. Gutters: Flash and seal gutters to downspouts and accessories.
  3. Leaf guards inside gutter at each downspout or rainwater leader opening.
- R. Slope gutters 1/4 inch per 10 feet, minimum.

### **3.04 OPENING FLASHING**

- A. Flash all wall openings as follows.
1. Install opening flashings after completion of air barriers.
  2. Install opening flashings (pre-molded corners and flexible flashings) in accordance with flexible flashing manufacturer's recommendations.
  3. Install premolded corner flashings at opening sill corners with nails or screws over layer of flexible flashing extended over face of sheathing and sill opening.
  4. Install flexible flashing across face of wall under opening, install additional layer as sill pan with ends turned up 3 inches, coordinate with weather-resistive barrier and jamb flashings to form water-shedding laps. Direct all water flow to exterior of building.
  5. Install flexible flashing at head and jamb under weather resistive barrier along opening header, coordinate to lap over sill pan described above, install flexible flashing across head of opening, extended past jamb flashings by 3 inches and secure with nails or screws to wall, fold weather resistive barrier down over head flashing and seal with tape.
  6. Flanged Fixtures (Window, Door, Louver, etc.): Set flanges of Head and Jamb in beads of sealant. Do not flash over bottom nailing flange. Do not seal bottom flange.

### **3.05 UTILITY WALL PENETRATION FLASHING INSTALLATION**

- A. Select prefabricated facility services utility penetration flashing sizes and profiles required to suit conditions.
- B. Install in accordance with manufacturer's recommendations, properly lapped with weather resistive barrier and related flashing and finishes to shed water to the building exterior.

### **3.06 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for field inspection requirements.

- B. Inspection will involve examination of work during installation to ascertain compliance with specified requirements.
- C. Tolerances
  - 1. Exposed surfaces: Free of dents, scratches, abrasions, or other visible defects; clean, ready for painting.
  - 2. Set flashings and sheet metal to straight, true lines with exposed faces aligned in plane as indicated.

### **3.07 SHOP FABRICATED SHEET METAL**

- A. Installer shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
- C. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.
  - 1. Hem exposed edges.
  - 2. Angle bottom edges of exposed vertical surfaces to form drip.
  - 3. Lap all corners with adjoining pieces, fasten and set in sealant.
- D. Form Joints for continuous strip flashings with a 1/4 inch opening between sections. Cover opening with a cover plate or back with an internal drainage plate formed to the profile of flashing piece. Embed cover plate in mastic, fastened through the opening between the sections and loose locked to the drip edges.

### **3.08 MANUFACTURED SHEET METAL SYSTEMS**

- A. Types specified in Section 07 7100. Coordinate with related work for complete watertight and weatherproof assemblies.

### **3.09 ADJUSTING**

- A. Water Test Gutters:
  - 1. Plug downspout inlets, fill gutters with water by hose.
  - 2. Allow filled gutters to rest for a period of 24 hours and observe for leaks.
  - 3. Mark all leaking locations for repair.
  - 4. Repair and re-test until all leaks are eliminated.

### **3.10 SCHEDULE - ROOF-RELATED SHEET METAL AND FLASHING**

- A. SBS Modified Bitumen Membrane Roofing (BUR): Galvanized Steel Sheet Metal, field painted per Section 09 9113.
  - 1. Continuous Cleats/Hook Strips, 24 ga.
  - 2. Securement Clips, 24, ga.
  - 3. Counterflashings, 24 ga.
  - 4. Sleeper Covers, 20 ga.
  - 5. Curb Covers, 20 ga.
  - 6. Transition Flashings, 24. ga.
  - 7. Scuppers, 24 ga.
  - 8. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports:
  - 9. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
  - 10. Copings and Engineered Metal Edge: Type specified in Section 07 7100.
- B. Thermoplastic Sheet Membrane Roofing (TPO or PVC):

1. Galvanized Steel Sheet Metal, field painted per Section 09 9113.
    - a. Continuous Cleats/Hook Strips, 24 ga.
    - b. Securement Clips, 24, ga.
    - c. Counterflashings, 24 ga.
    - d. Sleeper Covers, 20 ga.
    - e. Curb Covers, 20 ga.
    - f. Transition Flashings, 24. ga.
    - g. Scuppers, 24 ga.
  2. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
  3. Copings and Engineered Metal Edge: Type specified in Section 07 7100.
  4. Membrane Clad Steel. 24 gauge, type specified in related section specifying thermoplastic membrane roofing.
    - a. PVC Flanged items, as required for membrane adhesion. Coordinate with related section for extent.
    - b. PVC Transition Flashings.
    - c. PVC Scuppers.
- C. Preformed Metal Roofing (SSM), type(s) specified in related section(s). Roof-related sheet metal shall be same metal material and same finish as roof metal, gauge as recommended and as provided by roof manufacturer. 24 gauge minimum.
1. Counterflashings
  2. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
  3. Ridge, Rake, Eave, Jamb, Curb, etc. Flashings
  4. Gutters and Gutter Expansion Joints
  5. Downspouts (Above first floor elevation).
  6. Edge Metal (rake and eave trim, all other miscellaneous roofing related metal).
  7. Ridge, Rake, Eave, Jamb, Curb, Penetration and all other roof-related flashings.
- D. Asphalt Shingles (AS), type(s) specified in related section(s).
1. Galvanized Steel Sheet Metal, gauge as recommended by SMACNA for application, 24 gauge minimum, field painted per Section 09 9113.
    - a. Counterflashings
    - b. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
    - c. Ridge, Rake, Eave, Jamb, Curb, etc. Flashings
    - d. Gutters and Gutter Expansion Joints
    - e. Downspouts (Above first floor elevation).
    - f. Edge Metal (rake and eave trim, all other miscellaneous roofing related metal).
    - g. Ridge, Rake, Eave, Jamb, Curb, Penetration and all other roof-related flashings.
- E. Roof Tile, Concrete or Clay, (RT), type(s) specified in related section(s).
1. Galvanized Steel Sheet Metal, gauge as recommended by SMACNA for application, 24 gauge minimum, field painted per Section 09 9113.
    - a. Counterflashings
    - b. Ridge, Rake, Eave, Jamb, Curb, etc. Flashings
    - c. Gutters and Gutter Expansion Joints
    - d. Downspouts (Above first floor elevation).
    - e. Edge Metal (rake and eave trim, all other miscellaneous roofing related metal).
    - f. Ridge, Rake, Eave, Jamb, Curb, Penetration and all other roof-related flashings.

### 3.11 SCHEDULE - OTHER FLASHING

- A. Rain Drainage Work.

1. Rainwater leaders: Schedule 40 Steel Pipe, hot-dipped galvanized, types specified in Section 05 5000, field painted per Section 09 9113.
- B. Galvanized Steel Sheet Metal, gauge as recommended by SMACNA for application, 24 gauge minimum, field painted per Section 09 9113.
  1. Opening Flashings.
  2. Stucco/Plaster Stops and miscellaneous shapes as indicated.
  3. Stucco/Plaster Termination Screeds, custom or specially formed types.
  4. Siding stops and miscellaneous shapes as indicated.
  5. Attic/Soffit Vents, perforated.
- C. Stainless Steel, Type 304, gauge as recommended by SMACNA for application, 24 gauge minimum:
  1. Storefront and Curtain Wall Flashings: As specified in related sections.
  2. Flashing in contact with aluminum items.
  3. Inlet sleeves and Gutter Strainers at rainwater leaders to prevent contact with gutters of dissimilar metals.
  4. Sill pans at door and window openings.
- D. Types not otherwise scheduled: As recommended by referenced standards for application or condition indicated.

### **3.12 SCHEDULE - ROOF-RELATED SHEET METAL AND FLASHING - MARITIME EXPOSURE**

- A. SBS Modified Bitumen Membrane Roofing (BUR): Stainless Steel, Type 316.
  1. Continuous Cleats/Hook Strips, 24 ga.
  2. Securement Clips, 24, ga.
  3. Counterflashings, 24 ga.
  4. Sleeper Covers, 20 ga.
  5. Curb Covers, 20 ga.
  6. Transition Flashings, 24. ga.
  7. Scuppers, 24 ga.
  8. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports:
  9. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
  10. Copings and Engineered Metal Edge: Type specified in Section 07 7100.
- B. Thermoplastic Sheet Membrane Roofing (TPO or PVC):
  1. Stainless Steel, Type 316.
    - a. Continuous Cleats/Hook Strips, 24 ga.
    - b. Securement Clips, 24, ga.
    - c. Counterflashings, 24 ga.
    - d. Sleeper Covers, 20 ga.
    - e. Curb Covers, 20 ga.
    - f. Transition Flashings, 24. ga.
    - g. Scuppers, 24 ga.
  2. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
  3. Copings and Engineered Metal Edge: Type specified in Section 07 7100.
  4. Membrane Clad Steel. 24 gauge, type specified in related section specifying thermoplastic membrane roofing.
    - a. PVC Flanged items, as required for membrane adhesion. Coordinate with related section for extent.
    - b. PVC Transition Flashings.
    - c. PVC Scuppers.

- C. Preformed Metal Roofing (SSM), type(s) specified in related section(s). Roof-related sheet metal shall be same metal material and same finish as roof metal, gauge as recommended and as provided by roof manufacturer. 24 gauge minimum.
  - 1. Counterflashings
  - 2. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
  - 3. Ridge, Rake, Eave, Jamb, Curb, etc. Flashings
  - 4. Gutters and Gutter Expansion Joints
  - 5. Downspouts (Above first floor elevation).
  - 6. Edge Metal (rake and eave trim, all other miscellaneous roofing related metal).
  - 7. Ridge, Rake, Eave, Jamb, Curb, Penetration and all other roof-related flashings.
- D. Asphalt Shingles (AS), type(s) specified in related section(s).
  - 1. Copper, gauge as recommended by SMACNA for application, 16 oz. minimum.
    - a. Counterflashings
    - b. Ridge, Rake, Eave, Jamb, Curb, etc. Flashings
    - c. Gutters and Gutter Expansion Joints
    - d. Downspouts (Above first floor elevation).
    - e. Edge Metal (rake and eave trim, all other miscellaneous roofing related metal).
    - f. Ridge, Rake, Eave, Jamb, Curb, Penetration and all other roof-related flashings.
  - 2. Stainless Steel, Type 316, gauge as recommended by SMACNA for application, 24 gauge minimum.
    - a. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:
- E. Roof Tile, Concrete or Clay, (RT), type(s) specified in related section(s).
  - 1. Copper, gauge as recommended by SMACNA for application, 16 oz. minimum..
    - a. Counterflashings
    - b. Ridge, Rake, Eave, Jamb, Curb, etc. Flashings
    - c. Gutters and Gutter Expansion Joints
    - d. Downspouts (Above first floor elevation).
    - e. Edge Metal (rake and eave trim, all other miscellaneous roofing related metal).
    - f. Ridge, Rake, Eave, Jamb, Curb, Penetration and all other roof-related flashings.
  - 2. Stainless Steel, Type 316, gauge as recommended by SMACNA for application, 24 gauge minimum.
    - a. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches:

### 3.13 SCHEDULE - OTHER FLASHING - MARITIME EXPOSURE

- A. Galvanized Steel and Anodized Aluminum Not Permitted except as specified below.
- B. Rain Drainage Work.
  - 1. Rainwater leaders: Schedule 40 Steel Pipe, hot-dipped galvanized, types specified in Section 05 5000, field-painted per Section 09 9600.
- C. Stainless Steel, Type 316, gauge as recommended by SMACNA for application, 24 gauge minimum.
  - 1. Opening Flashings. (Doors, louvers, windows, fenestration).
  - 2. Stucco/Plaster Stops and miscellaneous shapes as indicated.
  - 3. Stucco/Plaster Termination Screeds, custom or specially formed types.
  - 4. Siding stops and miscellaneous shapes as indicated.
  - 5. Attic/Soffit Vents, perforated.
  - 6. Storefront and Curtain Wall Flashings: As specified in related sections.
  - 7. Flashing in contact with aluminum items.
  - 8. Inlet sleeves and Gutter Strainers at rainwater leaders to prevent contact with gutters of dissimilar metals.

9. Sill pans at door and window openings.
- D. Types not otherwise scheduled: As recommended by referenced standards for application or condition indicated.

**END OF SECTION**

**SECTION 07 7100**  
**ROOF SPECIALTIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Manufactured roof specialties, including copings and roof edge flashings, including reglets.
- B. Roof control and expansion joint covers.
  - 1. Flexible internal secondary gutter and drainage system.
- C. Pipe Penetration Curbs and Covers.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Pertinent Sections specifying Roofing and roof substrates.
- D. Section 07 6200 - Sheet Metal Flashing and Trim.
- E. Section 07 7200 - Roof Accessories: Manufactured curbs, roof hatches, and snow guards.

**1.03 REFERENCE STANDARDS**

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2017.
- C. NRCA (RM) - The NRCA Roofing Manual; 2017.
- D. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- E. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
- G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
- C. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes, demonstrate compliance with specified attributes. Provide data on shape of components, materials and finishes, anchor types and locations.
- D. CAL-GREEN Submittals: Product Data – VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.

- E. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work. Include isometric details of corner and transition condition.
  - 1. Coping Layout Drawings: Dimension coping in maximum lengths recommended by manufacturer. Indicate butt joints or splices evenly spaced for each run of parapet wall. Balance joints and spaces visually in each run. Dimension equal legs on mitered corner pieces (interior and exterior corners). Request Architect approval of layout in writing on shop drawing.
- F. Samples: Submit two sample, 12 inch in length, illustrating component shape, finish, and color. Submit samples of factory fabricated transitions and intersections.
- G. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.
- H. Warranty: Special warranty specified in this Section.
- I. Informational Submittals:
  - 1. Delegated-Design Submittal: For copings and roof edge flashings indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 2. Professional Engineer Qualifications: Demonstrate compliance with specified requirements.

#### **1.05 QUALITY ASSURANCE**

- A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of roof specialties that are similar to those indicated for this Project in material, design, and extent.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- C. Perform work in accordance with SMACNA (ASMM) details.
- D. Installer Qualifications: Company specializing in performing the work of this section on projects of similar size and scope and approved by manufacturer.

#### **1.06 COORDINATION**

- A. Coordinate installation of manufactured roof specialties with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

#### **1.07 WARRANTY**

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace manufactured roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.



1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
  - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
  - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Verify available warranties for finishes and insert number below. 20-year period is usually available for fluoropolymer finish and is maximum included with manufacturers' published data.
3. Finish Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives sealants, fillers, primers and coatings. Comply with limits specified in related section.
- B. General: Manufacture and install manufactured roof specialties to resist thermally induced movement and exposure to weather without failing, rattling, leaking, or fastener disengagement.
- C. Delegated Design: Design copings and roof edge flashings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- D. Edge Securement: Comply with CBC 1504.5 "Edge Securement for Low-Slope Roofs". Provide products tested for wind resistance in accordance with ANSI/SPRI ES-1, as required by the California Building Code, Chapter 15.
- E. Thermal Movements: Provide manufactured roof specialties that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- F. Water Infiltration: Provide manufactured roof specialties that do not allow water infiltration to building interior.
- G. Expansion Joint Covers: Flexible, waterproof, roof expansion joint assemblies, designed to permit plus or minus 50 percent dimensioned joint movement with full recovery, of fire-resistive capacity equal to adjacent roof/wall assemblies, compatible with adjacent systems and materials, internally drained with all collected water directed to the exterior.

### **2.02 COMPONENTS**

- A. Roof Edge Flashings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
  1. Configuration: Fascia, cant, and edge securement for roof membrane.
  2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
  3. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
  4. Finish: 70 percent polyvinylidene fluoride.
  5. Color: To be selected by Architect from manufacturer's custom range.

6. Manufacturers:
  - a. OMG Roofing Products; TerminEdge Fascia: [www.omgroofing.com/#sle](http://www.omgroofing.com/#sle).
  - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Copings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
  1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners.
  2. Mitered, welded corners to have equal dimension legs of manufacturer's minimum recommended length.
  3. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
  4. Snap-on Coping Anchor Plates: Concealed, stainless steel sheet, 12 inches (300 mm) wide, 0.028 inch (0.7 mm) thick, with integral cleats.
  5. Face Leg Cleats: Concealed, continuous stainless steel sheet.
  6. Internal Splice Plate with preformed channel, acting as a gutter chair to direct internal drainage to the exterior. Gauge and profile as recommended by manufacturer to suit conditions and loads indicated, stainless steel.
  7. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
  8. Finish: Three coat 70 percent polyvinylidene fluoride.
  9. Color: To be selected by Architect from manufacturer's custom range. Match Architect's sample.
  10. Coping Manufacturers:
    - a. ATAS International, Inc; Rapid-Lok Ultra Coping: [www.atas.com/#sle](http://www.atas.com/#sle).
    - b. Drexel Metals Inc; Spring-Tite Coping: [www.drexmet.com/#sle](http://www.drexmet.com/#sle).
    - c. Metal-Era Inc ; Perma-Tite Coping: [www.metalera.com/#sle](http://www.metalera.com/#sle).
    - d. Metal Roofing Systems, Inc; Rapid Lock Coping: [www.metalroofingsystems.biz/#sle](http://www.metalroofingsystems.biz/#sle).
    - e. OMG Roofing Products; PermaSnap Plus Coping: [www.omgroofing.com/#sle](http://www.omgroofing.com/#sle).
    - f. Substitutions: See Section 01 6000 - Product Requirements.
- C. Control and Expansion Joint Covers: Shapes and profiles as indicated, as required, and as recommended by manufacturer to suit application. Composite construction of flexible neoprene flashing of black color with closed cell urethane foam backing, each edge seamed to color coated galvanized steel sheet metal flanges, designed for nominal joint widths as indicated.
  1. Include factory fabricated special formed corners, tees, intersections, and wall flashings, each sealed watertight.
  2. Products:
    - a. Johns Manville Corporation; Product Expand-o-Flash: [www.jm.com](http://www.jm.com).
    - b. Watson Bowman Acme; Wabo@Flash: [www.wbacorp.com](http://www.wbacorp.com).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- D. Flexible Internal Gutter: Flexible fabric reinforced neoprene profile meeting required joint movement criteria, capable of compressing without damage during full cycle of joint closure. Collects and drain moisture through internal flexible drain tube. Compatible with expansion joint systems by other manufacturers.
  1. Gutter profile: 0.060 inch thick single ply reinforced EPDM sheet. Shore A hardness minimum 60 +/- 5, width of profile as required by joint type and movement requirements.
  2. Drain Tube: Provide 1-/12 inch i.d. 1/8 inch wall clear PVC tubing.
  3. Transition element: premolded 0.060 inch EPDM taper profile with pre-taped flange and adhesive for bond to underside of gutter profile.

4. Sealant: Types recommended by expansion joint manufacturer to suit application, compatible with adjacent substrates and roofing systems and approved by roofing manufacturer in writing.
  5. Products:
    - a. Watson Bowman Acme; Wabo@GutterFlex: [www.wbacorp.com](http://www.wbacorp.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- E. Counterflashings and Reglets:
1. Counterflashings: Manufactured units in lengths not exceeding 12 feet (3.6 m) designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal in thickness indicated:
    - a. Stainless Steel: 0.025 inch (0.64 mm) thick, No. 4 (bright, polished directional satin).
  2. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated with factory-mitered and -welded corners and junctions. Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashings indicated, from the following exposed metal in thickness indicated:
    - a. Stainless Steel: 0.025 inch (0.64 mm) thick, No. 4 (bright, polished directional satin).
    - b. For stucco application, with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
    - c. For concrete application with temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
  3. Accessories:
    - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
    - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
  4. Products:
    - a. Cheney Flashing Company, Inc.: [www.cheneyflashing.com](http://www.cheneyflashing.com).
    - b. Fry Reglet Corporation: [www.fryreglet.com](http://www.fryreglet.com).
    - c. OMG Roofing Products: [www.omgroofing.com](http://www.omgroofing.com).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- F. Pipe Penetration Curbs: Pipe Penetration Curbs and Covers, locate at grouped pipe penetrations serving mechanical unit locations. Size as recommended by manufacturer to accommodate piping indicated and to minimize number of curb penetrations required. Field located to avoid conflicts with other systems.
1. Finish: Field Painted.
  2. Insulated Curb for Non-Insulated Roof Decks: Fully mitered 3 inch cant, welded 18 gauge galvanized steel shell and base plate, 1-1/2 inch thick 3-pound density rigid insulation, factory installed 2 x 2 wood nailer, reinforcing on sides 36 inches and greater.
    - a. ThyCurb Model TC-2.
  3. Graduated Pipe Boot Cover: ABS thermoplastic korad acrylic cover, graduated boots molded of weather-resistant Plastisol and (2) stainless steel pipe clamps per boot.
    - a. ThyCurb Model TCC-5.
  4. Manufacturer:
    - a. Thybar Corp/ThyCurb: [www.thybar.com](http://www.thybar.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 FINISHES**

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; custom color to match approved sample.

### **2.04 ACCESSORIES**

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.
- C. Fasteners, separators, and other miscellaneous items as recommended by required to complete manufactured roof specialty systems.
- D. Sealants: Silicone types as specified in Section 07 9200.
- E. Roof Cement and related materials as required for installation with products specified in related sections.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.
  - 1. Refer to Section 07 7200 for information on roofing related accessories.

### **3.02 INSTALLATION**

- A. Anchor manufactured roof specialties securely in place and capable of resisting forces specified in performance requirements. Use fasteners, separators, sealants, and other miscellaneous items as required to complete manufactured roof specialty systems.
  - 1. Install manufactured roof specialties with provisions for thermal and structural movement.
  - 2. Torch cutting of manufactured roof specialties is not permitted.
  - 3. Seal joints within components when required by component manufacturer.
- B. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Coat concealed side of manufactured roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
  - 2. Underlayment: Where installing exposed-to-view components of manufactured roof specialties directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene underlayment.
- D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

- F. Install manufactured roof specialties level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil-canning, buckling, or tool marks.
- G. Install manufactured roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
- H. Coordinate installation of flashing flanges into reglets.
- I. Fire rated joint Covers: Install to requirements of fire rated design. Install fire barriers and flame sealant as required to provide indicated fire rating.
- J. Align work plumb and level, flush with adjacent surfaces.
- K. Install flexible gutter profile continuous along length of joint with drain tube assemblies spaced 25 feet on center, minimum of two drains per joint. Install drain systems as recommended by manufacturer. Direct all collected moisture to exterior of building.
- L. Rigidly anchor to substrate to prevent misalignment.

### **3.03 COPING INSTALLATION**

- A. Layout: Provide coping in maximum lengths recommended by manufacturer. Space butt joints or splices evenly for each run of parapet wall. Balance joints and spaces visually in each run.
- B. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- C. Coordinate with roof membrane and exterior cladding air barrier installation to ensure continuity and membrane seal across top of parapet wall.
- D. Anchor copings to resist uplift and outward forces according to performance requirements.
  - 1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's recommended spacing.

### **3.04 COUNTERFLASHING AND REGLET INSTALLATION**

- A. Counterflashings: Coordinate installation of counterflashings with installation of base flashings. Insert counterflashings in reglets or receivers and fit tightly to base flashings. Extend counterflashings 4 inches over base flashings. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.

### **3.05 CLEANING AND PROTECTION**

- A. Remove temporary protective coverings and strippable films as manufactured roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- B. Replace manufactured roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 07 7200**  
**ROOF ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Curbs.
- B. Equipment rails.
- C. Roof hatches.
- D. Non-penetrating pedestals.
- E. Roof hatch safety railing system.
- F. Rooftop support devices for pipes, conduits and ducts.
- G. Skylight Protection.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Pertinent Sections specifying Roofing and roof substrates.
- D. Section 07 6200 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.
- E. Section 07 7100 - Roof Specialties: Other manufactured roof items.

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1910.23 - Guarding floor and wall openings and holes; current edition.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- F. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- G. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- H. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

**1.04 SUBMITTALS**

- A. General: Submit in accordance with Section 01 3300.

- B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
- C. Product Data: Manufacturer's data sheets on each product to be used.
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Maintenance requirements.
- D. CAL-GREEN Submittals: Product Data – VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
- E. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
- F. Warranty Documentation:
  - 1. Submit manufacturer warranty.
  - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
  - 3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

#### **1.06 WARRANTY**

- A. Provide Manufacturer's full system material warranty necessary to cover all cost of repairs and/or replacement of all components of the system against defects in manufacturing for the same period and duration as specified in Division 7 roofing warranty. Warranty will not include Acts of God, vandalism, neglect, or improper spacing or installation of equipment.
- B. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

#### **1.07 PROJECT CONDITIONS**

- A. Verify that other trades with related work are complete before installing roof accessories. Coordinate installation with roof membrane and roof insulation manufacturer's instructions.
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Coordinate layout and installation of roof accessories with interfacing and adjoining construction to provide a leak-proof, weather-tight, secure, and non-corrosive installation.
  - 1. With Architect's written approval, adjust location of roof accessories that would interrupt roof drainage routes.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives sealants, fillers, primers and coatings. Comply with limits specified in related section.
- B. NO WOOD SLEEPERS will be allowed. Pipe supports in this Section shall be used where ever wood blocking/sleepers are indicated or where piping supports are required by code.

### **2.02 ROOF CURBS**

- A. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
  - 1. Roof Curb Mounting Substrate: Curb substrate consists of standing seam metal roof panel system.
  - 2. Sheet Metal Material:
    - a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
  - 3. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing system at 1:1 slope; minimum cant height 4 inches.
  - 4. Fabricate curb bottom and mounting flanges for installation directly on metal roof panel system to match slope and configuration of system.
    - a. Extend side flange to next adjacent roof panel seam and comply with seam configurations and seal connection, providing at least 6 inch clearance between curb and metal roof panel flange allowing water to properly flow past curb.
    - b. Where side of curb aligns with metal roof panel flange, attach fasteners on upper slope of flange to curb connection allowing water to flow past below fasteners, and seal connection.
    - c. Maintain at least 12 inch clearance from curb, and lap upper curb flange on underside of down sloping metal roof panel, and seal connection.
    - d. Lap lower curb flange overtop of down sloping metal roof panel and seal connection.
  - 5. Provide layouts and configurations indicated on drawings.
- B. Curbs Adjacent to Roof Openings: Provide curb on each side of opening, with top of curb horizontal for equipment mounting.
  - 1. Provide preservative treated wood nailers along top of curb.
  - 2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
- C. Equipment Rail Curbs: Straight curbs on each side of equipment, with top of curbs horizontal and level with each other for equipment mounting.

### **2.03 ROOF HATCHES AND VENTS**

- A. Roof Hatch Manufacturers:
  - 1. Babcock-Davis; ThermalMAX: [www.babcockdavis.com/#sle](http://www.babcockdavis.com/#sle).
  - 2. Bilco Company; Type E (ladder access, 3 ft square, solid cover): [www.bilco.com/#sle](http://www.bilco.com/#sle).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Roof Hatches and Smoke Vents: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
  - 1. Style: Provide flat metal covers unless otherwise indicated.
  - 2. Mounting: Provide frames and curbs suitable for mounting conditions as indicated on drawings.



3. Thermally Broken Hatches: Added insulation to frame and cover; available in each manufacturer's standard, single leaf sizes; special sizes available upon request
  4. Size(s): As indicated on drawings; single-leaf style unless indicated as double-leaf. Exception: If no size is indicated, provide minimum 36 inches by 36 inches.
  5. Finish: Factory-applied powder coat paint finish, color selected by Architect from manufacturer's standards, PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605;
- C. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
1. Material: Exposed surfaces PVDF finished aluminum, 11 gage, 0.0907 inch thick.
  2. Insulation: Manufacturer's standard; 3 inch rigid polyisocyanurate, located on outside face of curb.
  3. Curb Height: As required to maintain 8 inches vertical flashing leg above surface of roof membrane.
  4. Curb Height: 12 inches from finished surface of roof, minimum.
- D. Metal Covers: Flush, insulated, hollow metal construction.
1. Capable of supporting 40 psf live load.
  2. Material: PVDF finished aluminum; outer cover 11 gage, 0.0907 inch thick, liner 0.04 inch thick.
  3. Insulation: Manufacturer's standard 3 inch rigid polyisocyanurate.
  4. Gasket: Neoprene, continuous around cover perimeter.
- E. Safety Railing System: Manufacturer's standard accessory safety rail system mounted directly to curb.
1. Comply with 29 CFR 1910.23, with a safety factor of two.
  2. Posts and Rails: Aluminum.
  3. Gate: Same material as railing; automatic closing with latch.
  4. Finish: Manufacturer's standard, factory applied finish.
  5. Gate Hinges and Post Guides: ASTM B221 (ASTM B221M), 6063 alloy, T5 temper aluminum.
  6. Mounting Brackets: Hot dipped galvanized steel, 1/4 inch thick, minimum.
  7. Fasteners: Stainless steel, Type 316.
  8. Finish: PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605;
  9. Manufacturers:
    - a. Same as hatch manufacturer, or as approved by hatch manufacturer in writing.
- F. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
  2. Hinges: Heavy duty pintle type.
  3. Hold open arm with vinyl-coated handle for manual release.
  4. Latch: Upon closing, engage latch automatically and reset manual release.
  5. Manual Release: Pull handle on interior.
  6. Locking: Padlock hasp on interior.

#### **2.04 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES**

- A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
1. Design Loadings and Configurations: As required by applicable codes.

2. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
  3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
  4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
  5. Resilient Components: Molded 100 percent recycled rubber or HDPE plastic.
  6. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.
  7. Manufacturers:
    - a. PHP Systems/Design: [www.phpsd.com](http://www.phpsd.com).
    - b. RoofTop Accessories: [www.keycurb.com](http://www.keycurb.com).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Pipe Supports: Provide resilient base pipe curb attachment fixtures complying with MSS SP-58 and as indicated. If no supports are shown, provide types necessary to support items indicated, in compliance with referenced standard, to suit conditions shown.
1. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
  2. Provide vibration isolation and cushioning with minimum shock transmission to the substrate, allowing free movement, free of pipe tension or binding.
  3. See relevant piping system specification section for additional requirements.
- C. Duct Supports: KeyCurb Adjustable Support Model (AS). Supports piping and HVAC ducts. Two (2) KeyCurbs Model KS with cross bar to suspend hangers or adjustable rollers placed on top of cross bar.
- D. Conduit and Cable Tray Supports:
1. Type: KeyCurb Strut, Model (KS) Curb with a framing channel for strut clamps .
  2. Type: KeyCurb Strut Adjustable, Model (KSA) Curb with a framing channel and adjustable threaded rods for strut clamps.
- E. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
1. Bases: High density polypropylene or recycled rubber.
  2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
  3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
  4. Resilient Components: Molded 100 percent recycled rubber or HDPE plastic.

## 2.05 SKYLIGHT PROTECTION

- A. Fixed Railing System: Provide permanent means of fall protection for all skylight openings.
1. Rail system shall satisfy the requirements of OSHA 29 CFR 1910.23 and shall meet OSHA strength requirements with a factor of safety of two.
  2. Aluminum construction.
  3. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605;
  4. Safety Rail Source; Kee Dome Railing: [www.safetyrailsource.com](http://www.safetyrailsource.com).
  5. Substitutions: See Section 01 6000 - Product Requirements.

## 2.06 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; custom color to match approved sample.

## **2.07 ACCESSORIES**

- A. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
  - 1. Where removing exterior exposed fasteners affords access to building, provide nonremovable fastener heads.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.
- B. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.
- C. Cap Flashing: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counter-flashing). Seal overlap with thick bead of mastic sealant approved for application by roof manufacturer.
- D. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

### **3.04 PIPE SUPPORTS**

- A. Provide support for pipe routing as laid out in field.
- B. Set bases and support framing in locations specified or as required by site conditions but not to exceed 10'-0" spacing. Apply slip sheet or pad if required by roofing manufacturer.
- C. Adjust all frame structures to required height and weight, assemble framing, supports, and hangers to configuration indicated.
- D. Adjust each required hanger, roller or clamp to its desired height, check each support for equal weight dispersal.

### **3.05 CLEANING**

- A. Clean installed work to like-new condition.

### **3.06 PROTECTION**

- A. Protect installed products until completion of project.

- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**

**SECTION 07 9200**  
**JOINT SEALANTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Pertinent Sections specifying sealants or referencing this Section for sealant products and execution requirements.

**1.03 REFERENCE STANDARDS**

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2006 (Reapproved 2011).
- B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.
- C. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2000 (Reapproved 2011).
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- H. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).
- I. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.
- J. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).
- K. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.
- L. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).
- M. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- N. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- O. Manufacturer's recommendations and specifications.

- P. SWRI (VAL) - SWR Institute Validated Products Directory; Current Listings at [www.swrionline.org](http://www.swrionline.org).

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  2. List of backing materials approved for use with the specific product.
  3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  4. Substrates the product should not be used on.
  5. Substrates for which use of primer is required.
  6. Substrates for which laboratory adhesion and/or compatibility testing is required.
  7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
  8. Sample product warranty.
  9. Certification by manufacturer indicating that product complies with specification requirements.
  10. SWRI Validation: Provide currently available sealant product validations as listed by SWRI (VAL) for specified sealants.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
1. Manufacturer's Installation Instructions: Indicate limitations, special procedures, surface preparation, and perimeter conditions requiring special attention.
  2. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- D. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
  2. Joint-sealant manufacturer and product name.
  3. Joint-sealant formulation.
  4. Joint-sealant colors (multiple colors will be required).
- E. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- G. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
- H. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation as specified in Section 01 6116.

- I. Manufacturer Qualifications. Demonstrate compliance with specified requirements.
- J. Installer Qualifications. Demonstrate compliance with specified requirements.
- K. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
- L. Installation Plan: Submit at least four weeks prior to start of installation.
- M. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.
- N. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
- O. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.
- P. Installation Log: Submit filled out log for each length or instance of sealant installed.
- Q. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/ tests; include bagged test samples and photographic records, if any.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Manufacturer of sealant and caulking material to certify that cleaners, joint filler or bond breakers, and primers, for a particular application, are compatible with sealant.
- E. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
  - 1. Adhesion Testing: In accordance with ASTM C794.
  - 2. Compatibility Testing: In accordance with ASTM C1087.
  - 3. Allow sufficient time for testing to avoid delaying the work.
  - 4. Deliver to manufacturer sufficient samples for testing.
  - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
  - 6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.
- F. Installation Plan: Include schedule of sealed joints, including the following.
  - 1. Joint width indicated in Contract Documents.
  - 2. Joint depth indicated in Contract Documents; to face of backing material at centerline of joint.
  - 3. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
  - 4. Approximate date of installation, for evaluation of thermal movement influence.

5. Installation Log Form: Include the following data fields, with known information filled out.
  - a. Location on project.
  - b. Substrates.
  - c. Sealant used.
  - d. Primer to be used, or indicate as "No primer" used.
  - e. Size and actual backing material used.
  - f. Date of installation.
  - g. Name of installer.
  - h. Actual joint width; provide space to indicate maximum and minimum width.
  - i. Actual joint depth to face of backing material at centerline of joint.
  - j. Air temperature.
  
- G. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
  1. Identification of testing agency.
  2. Name(s) of sealant manufacturers' field representatives who will be observing
  3. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
    - a. Substrate; if more than one type of substrate is involved in a single joint, provide two entries on form, for testing each sealant substrate side separately.
    - b. Test date.
    - c. Location on project.
    - d. Sealant used.
    - e. Stated movement capability of sealant.
    - f. Test method used.
    - g. Date of installation of field sample to be tested.
    - h. Date of test.
    - i. Copy of test method documents.
    - j. Age of sealant upon date of testing.
    - k. Test results, modeled after the sample form in the test method document.
    - l. Indicate use of photographic record of test.
  
- H. Field Quality Control Plan:
  1. Visual inspection of entire length of sealant joints.
  2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
    - a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 24 inches thereafter.
    - b. If any failures occur in the first 10 linear feet, continue testing at 12 inch intervals at no extra cost to Owner.
  3. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
    - a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1000 linear feet, and one test per 1000 linear feet thereafter, or once per floor on each elevation.
    - b. If any failures occur in the first 1000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to Owner.
  4. Field testing agency's qualifications.
  5. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per



sealant/substrate combinations; include visual inspection and specified field testing;  
allow for possibility that more tests than minimum specified may be necessary.

- I. Field Adhesion Test Procedures:
  1. Allow sealants to fully cure as recommended by manufacturer before testing.
  2. Have a copy of the test method document available during tests.
  3. Take photographs or make video records of each test, with joint identification provided in the photos/videos; for example, provide small erasable whiteboard positioned next to joint.
  4. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
  5. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
  6. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
  7. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.
- J. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
  1. Record results on Field Quality Control Log.
  2. Repair failed portions of joints.
- K. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
  1. Sample: At least 18 inch long.
  2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
  3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.
  4. Record results on Field Quality Control Log.
  5. Repair failed portions of joints.

#### 1.06 MOCK-UP

- A. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- B. Construct mock-up with specified sealant types and with other components noted.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of Section 01 6000.
- B. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

- C. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

#### **1.08 FIELD CONDITIONS**

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
  - 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.
- D. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

#### **1.09 COORDINATION**

- A. Coordinate the work with all sections referencing this section.

#### **1.10 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

### **PART 2 PRODUCTS**

#### **2.01 SYSTEM DESCRIPTION**

- A. Performance Requirements:
  - 1. Building envelope:
    - a. Make watertight and weathertight without causing staining or deterioration of joint substrates.
    - b. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.
- B. Building Exterior and Interior:
  - 1. Seal the following joints with joint sealer:
    - a. Expansion and control joints in exterior walls, copings, parapets.
    - b. Expansion and control joints in interior concrete slab floors.
    - c. Joints between metal panels.
    - d. Joints between door and window frames and adjacent materials.
    - e. Joints between cabinets and countertops and walls.
    - f. Control joints in interior partitions, including portion above ceilings.
    - g. Expansion and control joints in solid exterior soffits.
    - h. Control joints in interior ceilings and soffits.
  - 2. Apply continuous bead of joint sealer in the following locations during installation of materials specified elsewhere:

- a. In lap joints of sheet metal construction.
  - b. Roofing panels and roof-related sheet metal and flashing.
  - c. Between partition floor and ceiling tracks and adjacent construction.
  - d. Between end stud of partition and adjacent construction.
  - e. Under door sills.
3. Acoustic Sealants at acoustic separations shall make assembly airtight.
    - a. Seal perimeter and intersections of finish.
    - b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
    - c. Seal pipes which penetrate acoustic separations.
  4. Joints not specifically mentioned above which require sealants to meet the performance criteria cited in this section.

## 2.02 MATERIALS

- A. Sealants and Primers - General: Provide products having volatile organic compound (VOC) content as specified in Section 01 6116.
- B. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- D. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- F. Colors: Provide color of exposed joint sealants to comply with the following:
  1. Provide colors matching selections made by Architect from manufacturer's full range of colors for products of type indicated. Colors may be listed in schedule at the end of this section or on the drawings. Request color selection for all products listed without a preselected color.

## 2.03 JOINT SEALANT APPLICATIONS

- A. Scope:
  1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    - a. Wall expansion and control joints.
    - b. Joints between door, window, and other frames and adjacent construction.
    - c. Joints between different exposed materials.
    - d. Openings below ledge angles in masonry.
    - e. Other joints indicated below.
  2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between door, window, and other frames and adjacent construction.

- b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
- c. Other joints indicated below.
3. Do not seal the following types of joints.
  - a. Intentional weepholes in masonry.
  - b. Intentional weepholes in window assemblies and head flashings.
  - c. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
  - d. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
  - e. Joints where installation of sealant is specified in another section.
  - f. Joints between suspended panel ceilings/grid and walls.
- B. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

#### 2.04 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 01 6116.
- B. Colors: As indicated on the drawings. If no colors are indicated, request colors before preparation of schedule submittals and include on all schedule submittals.

#### 2.05 NONSAG SILICONE JOINT SEALANTS

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
  1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
  2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
  3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
  4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
  5. Color: To be selected by Architect from manufacturer's standard range.
  6. Service Temperature Range: Minus 20 to 180 degrees F.
  7. Manufacturers:
    - a. Dow Chemical Company; DOWSIL 790 Silicone Building Sealant: [consumer.dow.com/en-us/industry/ind-building-construction.html/#sle](http://consumer.dow.com/en-us/industry/ind-building-construction.html/#sle).
    - b. Pecora Corporation: [www.pecora.com/#sle](http://www.pecora.com/#sle).
    - c. Sika Corporation; Sikasil WS-290: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
  1. Movement Capability: Plus and minus 50 percent, minimum.
  2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
  3. Color: To be selected by Architect from manufacturer's standard range.
  4. Cure Type: Single-component, neutral moisture curing
  5. Service Temperature Range: Minus 65 to 180 degrees F.
  6. Manufacturers:
    - a. Dow Corning Corporation; 795: [www.dowcorning.com](http://www.dowcorning.com).
    - b. Sika Corporation; Sikasil WS-295: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.

- C. Silicone Sealant: ASTM C920, Type S, Grade NS, Class 25, single component, neutral curing, non-sagging, non-staining, non-bleeding, RTV silicone designed for adhesion to low energy surfaces common in sheet or peel-and-stick flexible flashings and air/weather barriers.
  - 1. Color: To be selected by Architect from manufacturer's standard range.
  - 2. Service Temperature Range: -65 to 180 degrees F.
  - 3. Products:
    - a. Dow Corning Corporation; 758: [www.dowcorning.com](http://www.dowcorning.com).
    - b. Sika Corporation, Construction Products Division; Sikasil-N.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  
- D. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A, Class 25; Use NT, A, and O, single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
  - 1. Color: White.
  - 2. Manufacturers:
    - a. Master Builders; Omniplus: [www.master-builders-solutions.com](http://www.master-builders-solutions.com).
    - b. Dow Corning Corporation; 786-M White.
    - c. GE Construction Sealants; SCS1700 Sanitary.
    - d. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): [www.pecora.com/#sle](http://www.pecora.com/#sle).
    - e. Sika Corporation; Sikasil GP: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
    - f. Substitutions: See Section 01 6000 - Product Requirements.

## 2.06 URETHANE NON-SAG SEALANTS

- A. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; multi-component; not expected to withstand continuous water immersion or traffic.
  - 1. Movement Capability: Plus and minus 35 percent, minimum.
  - 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: Custom as selected..
  - 4. Manufacturers:
    - a. Master Builders Solutions; [www.master-builders-solutions.com](http://www.master-builders-solutions.com), MasterSeal (Sonolastic) NP-2.
    - b. Sika Corporation; Sikaflex-2c NS: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  
- B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
  - 1. Movement Capability: Plus and minus 25 percent, minimum.
  - 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: To be selected by Architect from manufacturer's standard range.
  - 4. Products:
    - a. Master Builders Solutions; [www.master-builders-solutions.com](http://www.master-builders-solutions.com), MasterSeal (Sonolastic) NP-1.
    - b. Sika Corporation; Sikaflex-1a: [www.usa-sika.com](http://www.usa-sika.com).
    - c. Substitutions: See Section 01 6000 - Product Requirements.

## 2.07 ACRYLIC LATEX JOINT SEALANTS

- A. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use, paintable.
  - 1. Color: To be selected by Architect from manufacturer's standard range.
  - 2. Manufacturers:

- a. Master Builders Solutions; MasterSeal NP 520 (Sonolac):  
www.master-builders-solutions.com.
  - b. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle.
  - c. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk:  
www.sherwin-williams.com/#sle.
  - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag; not expected to withstand continuous water immersion or traffic.
1. Color: To be selected by Architect from manufacturer's standard range.
  2. Manufacturers:
    - a. Bostik Inc.; Chem-Calk 300.
    - b. Pecora Corporation; Pecora BC-158 Butyl Rubber Sealant: www.pecora.com/#sle.
    - c. Sherwin-Williams Company; Storm Blaster All Season Sealant:  
www.sherwin-williams.com/#sle.
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Non-Curing Butyl Sealant: Solvent-based, single component, non-sag, non-skinning, non-hardening, non-bleeding; non-vapor-permeable; intended for fully concealed applications.
1. Manufacturers:
    - a. Pecora Corporation; Pecora BA-98 Non-Skinning Butyl Sealant:  
www.pecora.com/#sle.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Type - Acoustical Sealant: Acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning, ASTM C-834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Composition: Acrylic latex emulsion sealant.
  2. Applications: Use for concealed locations only:
    - a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
    - b. Locations indicated and as required to meet acoustic requirements of walls and partitions.
  3. Products:
    - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant: www.pecora.com, at fire-rated construction.
    - b. Hilti, Inc.; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com.
    - c. Hilti, Inc.; CP 572 Smoke and Acoustical Spray Sealant: www.us.hilti.com.
    - d. Master Builders Solutions; MasterSeal NP 520: www.master-builders-solutions.com.
    - e. Substitutions: See Section 01 6000 - Product Requirements.

## 2.08 SELF-LEVELING SEALANTS

- A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1. Movement Capability: Plus and minus 25 percent, minimum.
  2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
  3. Color: To be selected by Architect from manufacturer's standard range.
  4. Color at colored concrete: Custom-mixed colors matching colored concrete floors or paving.

5. Service Temperature Range: Minus 40 to 180 degrees F.
6. Manufacturers:
  - a. Master Builder Solutions; MasterSeal (Sonolastic) SL 2 Slope Grade or Self Leveling Sealant: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - b. Sika Corporation; Sikaflex-2c SL: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
  - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Concrete Paving Joint Sealant: Polyurethane, pourable self-leveling; ASTM C920, Class 25, Uses T, I, M and A; multi- component.
  1. Color: Custom mixed color matching colored concrete.
  2. Products:
    - a. Master Builders Solutions; MasterSeal (Sonolastic) SL-2: [www.master-builders-solutions.com](http://www.master-builders-solutions.com).
    - b. Pecora Corporation; Dyna-Trol II-SG: [www.pecora.com](http://www.pecora.com).
    - c. Sika Corporation, Construction Products Division; Sikaflex 2C-SL.
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
  1. Meet requirements of American Concrete Institute 302.1 R-04 "Guide for Concrete Floor and Slab Construction" and American Concrete Institute 360 R10 "Guide to Design of Slabs-on-Ground" for industrial floor joint fillers
  2. Composition: Multi-component, 100 percent solids by weight.
  3. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
  4. Color: To be selected by Architect from manufacturer's standard colors.
  5. Joint Width, Minimum: 1/8 inch.
  6. Joint Width, Maximum: 1/4 inch.
  7. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.
  8. Manufacturers:
    - a. Euco 700 by The Euclid Chemical Company.
    - b. MM-80 by Metzger-McGuire.
    - c. Master Builders Solutions, MasterSeal CR 190: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
    - d. W.R. Meadows, Inc; Rezi-Weld Flex: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.

## 2.09 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
  1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
  2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
  3. Open Cell: 40 to 50 percent larger in diameter than joint width.
  4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Tape Sealant: Double-sided rubber-backed butyl tape sealant, 35 mil thickness, adhesive strength 88 oz/in. Widths as required to suit application, black color. Grainger, [www.grainger.com](http://www.grainger.com).
  1. Substitutions: See Section 01 6000 - Product Requirements.

- C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- D. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- E. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- F. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.
- D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
  - 1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
  - 2. Notify Architect of date and time that tests will be performed, at least 7 days in advance.
  - 3. Arrange for sealant manufacturer's technical representative to be present during tests.
  - 4. Record each test on Preinstallation Adhesion Test Log as indicated.
  - 5. If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect.
  - 6. After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

#### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

#### **3.03 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.



- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- H. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- I. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
  - 1. Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
  - 2. Provide concave joint configuration per Figure 8A in ASTM C 1193, unless otherwise indicated.
  - 3. Provide flush joint configuration, per Figure 8B in ASTM C 1193, where indicated.
  - 4. Provide recessed joint configuration, per Figure 8C in ASTM C 1193, of recess depth and at locations indicated.
    - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
- J. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

### **3.04 FIELD QUALITY CONTROL**

- A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- C. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.
- D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.
- E. Repair destructive test location damage immediately after evaluation and recording of results.

### **3.05 FINISHING**

- A. Work that is exposed to view: Uniform surface with neat, straight edges and no excess material on adjacent surface.

### **3.06 CLEANING**

- A. Clean adjacent soiled surfaces.

### **3.07 PROTECTION**

- A. Protect sealants until cured. Replace damaged work with repairs indistinguishable from original work.

### 3.08 SCHEDULE

- A. Architect will provide color selections and locations for each sealant type and for Contractor's use. Not all locations will have the same color.
  - 1. Custom colors will be required.
- B. Exterior Locations:
  - 1. Joints which are bordered by glass: Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
    - a.
  - 2. Joints which are bordered by plastic: Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
    - a.
  - 3. Horizontal joints in sidewalks, decks, concrete floors, and driveways: Exterior or Interior Horizontal Expansion Joint Sealant - Polyurethane, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A; single component.
    - a. At walk expansion joints.
    - b. Where walks abut structural slabs or stoops.
    - c. Where walks abut exterior wall of buildings.
    - d. Where exposed interior concrete slabs abut vertical surfaces.
    - e. Where sealant is shown on the Drawings for concrete slabs.
    - f.
  - 4. Locations requiring adhesion to low energy surfaces common in sheet or peel-and-stick flexible flashings and air/weather barriers: ASTM C920, Type S, Grade NS, Class 25, single component, neutral curing, non-sagging, non-staining, non-bleeding, RTV silicone.
    - a.
  - 5. Membrane Roofing Sealants: Types recommended by roofing manufacturer and complying with requirements of this section.
  - 6. Steep Slope Roofing Sealants: Types recommended by roofing manufacturer and complying with requirements of this section.
  - 7. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this section.
  - 8. All other exterior joints including around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials (interior and exterior), Sills and thresholds, and at miscellaneous locations where sealant is shown on Drawings, exterior joints where no other sealant is indicated:
    - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50% extension and compression movement.
    - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
  - 9. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this section.
  - 10. Exterior Metal Panel Butt Joints and trim: Types recommended by manufacturer and complying with requirements of this section.
- C. Interior Locations:
  - 1. Expansion and control joints, around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials, sills and thresholds, and at miscellaneous locations where sealant is shown on Drawings:

- a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50% extension and compression movement.
- b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
2. Interior Concrete Slabs on Grade:
  - a. General Locations: Exterior or Interior Horizontal Expansion Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A; single component.
3. Interior wet areas, around plumbing fixtures, countertops abutting walls, food service applications: Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT, A and O.
4. Interior static dry joints as required to dress appearance, Other interior joints for which no other type of sealant is indicated.: Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
5. Where required for sound control: Acoustical Sealant, ASTM C-834.
6. Where required for sound control with limited flame spread: Acoustical Sealant, ASTM C-834, fire-rated type.

D. General:

1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements, Other joints for which no other type of sealant is indicated.:
  - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50% extension and compression movement.
  - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
2. Specialty perimeters where required for appearance or weathertightness:
  - a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT, M, A and O; capable of 50% extension and compression movement.
  - b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

**3.09 POST-OCCUPANCY**

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

**END OF SECTION**

**SECTION 08 3100**  
**ACCESS DOORS AND PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations wherever required for access to enclosed spaces or equipment.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Section 09 9123 - Interior Painting: Field paint finish.
- D. Pertinent sections of other Divisions specifying components requiring access.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2016.
- C. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- E. ITS (DIR) - Directory of Listed Products; current edition.
- F. Manufacturer's recommendations and specifications.
- G. UL (FRD) - Fire Resistance Directory; current edition.
- H. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- I. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- J. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code, "CAL-Green".

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Schedule: Tabular listing of access doors and panels, indicating location, size, materials, fire rating, device or purpose for access.
- C. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- D. CAL-GREEN Submittals: Product Data – VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.

- E. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- F. Manufacturer's Installation Instructions: Indicate installation requirements for fire rated units.
- G. Project Record Documents: Record actual locations of each access unit.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five (5) years documented experience.

#### **1.06 REGULATORY REQUIREMENTS**

- A. Conform to Title 24, Part 2, California Building Code for fire rated access doors.
  - 1. Provide access doors of fire rating equivalent to the fire rated assembly in which they are to be installed.
- B. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

#### **1.07 PROJECT CONDITIONS**

- A. Coordinate the work with other work requiring access doors.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Provide door seals for access doors located in sound isolating walls or ceilings.
- C. Provide door covered access into all attic spaces and at all portions of the work to which access is necessary for periodic inspection, adjustments, or maintenance, and which is enclosed behind finish materials, including, but not limited to, valves, water hammer arrestors, mechanical units, electrical panels and outlets, equipment and systems.

#### **2.02 MANUFACTURERS**

- A. Wall and Ceiling Access Doors:
  - 1. Karp Associates, Inc: [www.karpinc.com](http://www.karpinc.com).
  - 2. Milcor by Commercial Products Group of Hart & Cooley, Inc: [www.milcorinc.com](http://www.milcorinc.com).
  - 3. Nystrom, Inc: [www.nystrom.com](http://www.nystrom.com).
  - 4. J. L. Industries, [www.jlindustries.com](http://www.jlindustries.com).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.03 ACCESS DOORS AND PANELS**

- A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies where units are to be installed.

#### **2.04 ACCESS DOOR UNITS - WALLS AND CEILINGS**

- A. Door sizes: Unless otherwise specifically noted on drawings; smallest standard size which will permit ready access and removal of working parts requiring maintenance.
- B. Door and Frame Units: Formed steel and stainless steel where noted.
  - 1. Frames and flanges: 0.058 inch steel.
  - 2. Door panels: 0.070 inch single thickness steel sheet.

3. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
  - a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
4. Steel Finish: Primed.
5. Stainless Steel Finish: No. 4 brushed finish.
6. Door/Panel Size: As indicated on the drawings.
7. Hardware:
  - a. Hardware for Fire-Rated Units: As required for listing.
  - b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
  - c. Hinge: 175 degree stainless steel piano hinge with pin.
  - d. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.

## **2.05 FABRICATION**

- A. Weld, fill, and grind joints to ensure flush and square unit.

## **2.06 FINISHES**

- A. General: Provide doors and/or panels of the following finishes as scheduled.
  1. Galvanized, hot dipped finish.
  2. Prime coat with alkyd primer.
  3. Stainless Steel Finish, Type 304 or Type 316: No. 4 finish.

## **2.07 SOURCE QUALITY CONTROL**

- A. Certifications: Furnish each fire rated door with affixed label of Underwriters Laboratories (UL), Warnock Hersey International (WHI), or other approved independent testing laboratory and inspection service, certifying scheduled fire rating.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Investigate conditions requiring access, select panels of suitable type and configuration for conditions indicated.
- B. For conditions requiring access and for which panels or doors are not otherwise shown, recommend panel or door type and size for Architect's review.
- C. Verify that rough openings are correctly sized and located.

### **3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to the concealed work requiring access. Avoid conflict with other building elements.

### **3.03 SCHEDULE**

- A. Exterior Doors and Panels: Galvanized for site finishing specified in 09 9113.
- B. Interior Doors and Panels in Restrooms, Food Preparation, Locker Rooms and in ceramic tile surfaced walls wherever located: Stainless steel construction, Type 304, No. 4 finish.
- C. Interior Doors and Panels in all other locations: Primed for site finishing specified in 09 9123.

**END OF SECTION**

**SECTION 09 2116**  
**GYP SUM BOARD ASSEMBLIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Gypsum board furring systems.
- B. Gypsum sheathing.
- C. Gypsum wallboard.
- D. Joint treatment and accessories.
- E. Textured finish system.
- F. Trim and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- D. Division 09: Pertinent sections specifying finishes installed over gypsum board substrates.
- E. Section 09 9123 - Interior Painting.
- F. Pertinent sections specifying facility services items penetrating gypsum board.

**1.03 REFERENCE STANDARDS**

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
- B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
- C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
- H. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2009).
- I. ASTM C 635, Standard Specifications for Metal Suspension Systems.
- J. ASTM C 636, Recommended Practice for Installation of Metal Suspension Systems.
- K. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

- L. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.
- M. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
- N. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
- O. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
- P. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
- Q. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.
- R. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.
- S. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing Board; 2013.
- T. ASTM C1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2014.
- U. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- V. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2015.
- W. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2013.
- X. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.
- Y. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.
- Z. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 1995a.
- AA. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- AB. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
- AC. CISCA Ceiling Systems Installation Handbook.
- AD. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments, Chapter 8.
- AE. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code, "CAL-Green".
- AF. Division of the State Architect (DSA) Interpretation of Regulations: IR 25-3, Drywall Ceiling Suspension Conventional Construction One-Layer.
- AG. GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association; 2007
- AH. GA-216 - Application and Finishing of Gypsum Board; 2013.



- AI. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.
- AJ. GA-600 - Fire Resistance Design Manual; 2015.

#### **1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
- C. Shop Drawings: Indicate special details associated with fireproofing and metal suspension systems.
  - 1. Reflected ceiling plans: Submit ceiling suspension system layout indicating dimensions, lighting fixture locations, and related mechanical components.
  - 2. Assembly drawings: Indicate installation details, accessory attachments and installation of related lighting fixtures and related mechanical system components.
  - 3. System details: Submit manufacturer's catalogue cuts or standard drawing showing details of system with project conditions clearly identified and manufacturer's recommended installation instructions.
- D. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
- E. Product Data: Provide data on metal framing and gypsum board.
- F. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- G. CAL-GREEN Submittals: Product Data – VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
- H. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches in size, illustrating finish color and texture.
- I. Two samples 8 x 10 inch in size of tack board substrate, with manufacturer's labeling attached.

#### **1.05 QUALITY ASSURANCE**

- A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
  - 1. Maintain one copy of standards at project site.
- B. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum five years of experience.

#### **1.06 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for fire rated assemblies as indicated on drawings.

#### **1.07 PROJECT CONDITIONS**

- A. Suspended Ceiling Systems - General: Coordinate with other work supported by or penetrating through the ceiling, including mechanical and electrical work and partition systems.
  - 1. Mechanical work: Ductwork and piping above system shall be complete, and permanent HVAC systems operating.

2. Electrical Work: Installation of conduit above suspension system shall be complete before installation of suspension system.

## **PART 2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.

### **2.02 METAL FRAMING MATERIALS**

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
  1. CEMCO; [www.cemcosteel.com](http://www.cemcosteel.com).
  2. Clarkwestern Dietrich Building Systems LLC: [www.clarkdietrich.com](http://www.clarkdietrich.com).
  3. SCAFECO Corporation: [www.scafco.com/#sle](http://www.scafco.com/#sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 4000.
- C. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
- D. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, size and gage to comply with ASTM C 754 at spacing indicated; maximum deflection L/240 at 5 psf.
  1. Studs: "C" shaped with flat or formed webs with knurled faces.
  2. Runners: U shaped, sized to match studs.
  3. Resilient Channels, wall and ceiling sound attenuation: U. S. Gypsum "Sheetrock" brand RC-1 Resilient Channels, roll formed 25 gage, corrosion resistant steel, attached with screws through pre-punched holes in inner flange, gypsum board or panel screw attached to knurled outer flange, spacings as recommended by manufacturer for framing spacings indicated.
  4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
  5. Additional profiles: Types indicated or as required to suit conditions, conforming to referenced standards or as recommended by metal framing manufacturer.
- E. Resilient Channels, wall and ceiling sound attenuation: USG "Sheetrock" brand RC-1 Resilient Channels, roll formed 25 gage, corrosion resistant steel, attached with screws through pre-punched holes in inner flange, gypsum board or panel screw attached to knurled outer flange, spacings as recommended by manufacturer for framing spacings indicated.
- F. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- G. Ceiling Suspension System for Gypsum Board: USG Flat Drywall Suspensions Systems: Cold rolled steel, hot dipped galvanized finish; UL listed for fire-ratings indicated, approved by Division of State Architect and complying with IR 25-3.
  1. Main Tees: Fire-Rated Heavy Duty classification, integral reversible splice with 15/16 knurled face.
  2. Cross Members: Fire-Rated members with 1-1/2 inch knurled face. Tees must have quick release cross tee ends to provide positive locking and removability without the need for tools.
  3. Furring Channels: 7/8 inch high with 1-1/2 inch face.
  4. Accessory Cross Tees: Cross tees must have knurled faces. Cross tees have quick release cross tee ends to provide positive locking and removability without the need for tools.
  5. Wall moldings: Single web with knurled face.

6. Accessories: Manufacturer's standard types suited for conditions indicated.
  - a. Transition Clip DGTC-90
  - b. Splice Clip DGSC-180
- H. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
  1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
  2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
  3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
  4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
- I. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
  1. Products:
    - a. ClarkDietrich; BlazeFrame Firestop Deflection Track: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- J. Non-Loadbearing Framing Accessories:
  1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
  2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
    - a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
    - b. Products:
      - 1) ClarkDietrich; Pony Wall (PW): [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).

## 2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
  1. Georgia-Pacific Gypsum: [www.gpgypsum.com](http://www.gpgypsum.com).
  2. National Gypsum Company: [www.nationalgypsum.com](http://www.nationalgypsum.com).
  3. PABCO Gypsum: [www.pabco gypsum.com](http://www.pabco gypsum.com).
  4. USG Corporation: [www.usg.com](http://www.usg.com).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
  2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
  3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    - a. Mold resistant board is required at all locations.
  4. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
  5. Thickness:
    - a. Vertical Surfaces: 5/8 inch.
    - b. Ceilings: 5/8 inch.
    - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
  6. Mold Resistant Paper Faced Products:

- a. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
  - b. National Gypsum Company; Gold Bond XP Gypsum Board.
  - c. Substitutions: See Section 01 6000 - Product Requirements.
7. Glass Mat Faced Products:
- a. Georgia-Pacific Gypsum; DensArmor Plus Fireguard C.
  - b. National Gypsum Company; Gold Bond eXP Fire-Shield Interior Extreme Gypsum Panel.
  - c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Impact Resistant Wallboard:
1. Application: High-traffic areas indicated.
  2. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
  3. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
  4. Hard Body Impact: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
  5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  6. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
  7. Type: Fire resistance rated Type X, UL or WH listed.
  8. Thickness: 5/8 inch.
  9. Edges: Tapered.
  10. Glass Mat Faced Products:
    - a. Georgia-Pacific Gypsum; DensArmor Plus Impact-Resistant.
    - b. National Gypsum Company; Gold Bond eXP Interior Extreme IR Gypsum Panel.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- D. Backing Board For Wet Areas:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
  2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
    - a. Thickness: 1/2 inch.
    - b. Products:
      - 1) Custom Building Products: [www.custombuildingproducts.com/#sle](http://www.custombuildingproducts.com/#sle).
      - 2) National Gypsum Company; PermaBase Cement Board: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
      - 3) USG Corporation: [www.usg.com/#sle](http://www.usg.com/#sle).
  4. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
    - a. Fire Resistant Type: Type X core, thickness 5/8 inch.
    - b. Products:
      - 1) Georgia-Pacific Gypsum; DensShield Tile Backer.
      - 2) Substitutions: See Section 01 6000 - Product Requirements.
- E. Moisture-Resistant Gypsum Backing Board: ASTM C1396/C1396M; ends square cut. Fire-rated Type X where occurring in designated rated assemblies.
1. Thickness: 5/8 inch.
  2. Edges: tapered.
- F. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, and inside faces (roof side) of parapet walls.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Fungal Resistance: No fungal growth when tested in accordance with ASTM G21.
4. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
5. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
6. Core Type: Type X.
7. Type X Thickness: 5/8 inch.
8. Edges: Square.
9. Glass Mat Faced Products:
  - a. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing.
  - b. National Gypsum Company; Gold Bond eXP Sheathing.
  - c. Substitutions: See Section 01 6000 - Product Requirements.

#### 2.04 Gypsum Wallboard ACCESSORIES

- A. Acoustic Insulation: Acoustic fiberglass batt type specified in Section 07 2100. Thickness as shown on drawings or as specifically noted; Provide to fill framing cavity depth otherwise.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
  1. Products:
    - a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: [www.titebond.com/#sle](http://www.titebond.com/#sle).
    - b. Liquid Nails, a brand of PPG Architectural Coatings; AS-825 Acoustical Sound Sealant: [www.liquidnails.com/#sle](http://www.liquidnails.com/#sle).
    - c. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: [www.stifirestop.com/#sle](http://www.stifirestop.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- C. Board Insulation in furring cavities: Rigid polyisocyanurate, type specified in Section 07 2100.
- D. Water-Resistive Barrier: As specified in Section 07 2500.
- E. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated. Mechanically fastened.
  1. Types: As detailed or required for finished appearance.
  2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.
- F. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
  1. Corner Beads: Low profile, for 90 degree outside corners.
    - a. Products:
      - 1) CertainTeed Corporation; No-Coat Drywall Corner: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
      - 2) ClarkDietrich; Strait-Flex Big-Stick: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
      - 3) Phillips Manufacturing Co; Everlast Corner Bead: [www.phillipsmfg.com/#sle](http://www.phillipsmfg.com/#sle).
      - 4) Substitutions: See Section 01 6000 - Product Requirements.
  2. Corner Beads: Low profile, for archways.
    - a. Products:
      - 1) ClarkDietrich; Strait-Flex Arch-Stick: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  3. Expansion Joints:
    - a. Type: V-shaped metal with factory-installed protective tape.

- G. Decorative Metal Trim:
  - 1. Material: Extruded aluminum alloy 6063-T5 temper.
  - 2. Finish: Anodized, clear.
  - 3. Type: Profile as selected from manufacturer's standard range.
  - 4. Corner Trim: As indicated.
  - 5. Reveal Trim: Fry DA.1; Width and Depth as indicated on Drawings, minimum 1/2 inch by 1/2 inch. If no dimensions are shown, request dimensions from Architect.
  - 6. Products:
    - a. Fry Reglet Corporation.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- H. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions. Water resistant where used with water resistant backer board.
  - 1. Tape: 2 inch wide, creased paper tape for joints and corners, USG "Perf-A-Tape", or equal.
  - 2. Joint Compound: Drying type, vinyl-based, ready-mixed.
- I. Finishing Compound: Surface coat and primer, takes the place of skim coating.
- J. High Build Drywall Surfacers: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- K. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
- L. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.
- M. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- N. Adhesives
  - 1. Modified contact adhesive: As recommended by the gypsum board manufacturer and having a placement time before setting of at least 15 minutes.
  - 2. Joint compound adhesive: As recommended by the gypsum board manufacturer.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Verify that framed substrates demonstrate flatness characteristics such that work of this section will meet specified tolerances.

#### **3.02 INSTALLATION - GENERAL**

- A. Install materials in accordance with gypsum board application and finishing standards referenced.
  - 1. Single layer application: Screw attachment.
  - 2. Float interior angles, except where required to conform to fire or acoustical separation requirements.
  - 3. Do not install scored, scratched, broken, damp, or otherwise damaged boards.
  - 4. Smooth cut edges and ends to obtain neat fitting joints.

### 3.03 FRAMING INSTALLATION

- A. Metal Framing: Comply with ASTM C 754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits:
  - 1. Install in accordance with CBC Chapter 25, DSA IR 25-3, ASTM C636, CISCA installation standards, and other applicable code references. Conform to all requirements for seismic resistance and fire ratings indicated.
  - 2. Install in accordance with manufacturer's current printed recommendations.
  - 3. Install in accordance with approved shop drawings and locate ceiling in accordance with main tee dimensions relative to elevations.
  - 4. Component and hanger wire installation:
    - a. Flat Ceilings: Main tees shall be spaced a maximum of 48 inches on center and supported by hanger wires spaced at maximum 48 inches on center and as specified by UL Fire Resistance Directory attaching hanger wires directly to structure above. Cross tees shall be spaced per manufacturers' recommendations and as specified by UL Fire Resistance Directory.
  - 5. Transitions: Changes in Elevation in Soffit and Fascia Ceiling Applications.
    - a. When constructing stepped soffits, provide bracing of the drywall suspension system and/or additional hanger wires as necessary to ensure stability and structural performance during and after drywall attachment.
    - b. The maximum vertical soffit height is 48 inches. Maximum unsupported drywall area shall not exceed 48 inches x 24 inches.
    - c. Cross tee spacing in horizontal soffit plane is not to exceed 24 inches.
    - d. Provide intermediate cross tees as necessary to maintain visually acceptable drywall planes and drywall corners.
  - 6. Hanger Wires: Required within 12 inches on both sides of a pivoted splice clip. At least 1 hanger wire is required within 12 inches of a transition clip. Provide additional wires to conform to requirements of IR-25-3.
    - a. Limitations: Do not support wires from mechanical or electrical equipment occurring above ceiling.
  - 7. Accessories: Install accessories as required and as applicable to meet project requirements.
  - 8. Gypsum Panel Installation : Apply gypsum panels first to ceiling and then to walls. Position all ends and edges of gypsum panels at framing members. Extend ceiling board to corners and make firm contact with the wall angle, channel or top plate. To minimize end joints, use panels of maximum practical lengths. Fit ends and edges closely, but not forced together.
  - 9. Cut ends, edges, scribe or make cutouts within the field of panels in a workmanlike manner. Cut gypsum board to size using a knife and straight edge.
  - 10. Attach Gypsum Panels to the suspension system main runners, cross tees and cross channels with conventional gypsum panel fasteners ( No. 6 Type S HiLo bugle head, self-drilling, self-tapping steel screws) spaced 8 inches o.c. at periphery of gypsum panels and located 3/8 inches in from panel edges and spaced 12 inches o.c. in the field. Drive fasteners in field of panels first, working toward ends and edges. Hold panels in firm contact with framing while driving fasteners. Drive fastener heads slightly below surface of gypsum panels without breaking face paper. Install trim at all internal and external angles formed by the intersection of panel surfaces or other dissimilar materials. Apply corner reinforcement to all vertical or horizontal external corners in accordance with manufacturer's directions.
  - 11. Drywall support grid is designed to support only the ceiling load. Heavy concentrated loads shall be independently supported. Lighting fixtures, air vents and other equipment

shall be separately supported from the structure; Gypsum Panels will not support these items.

12. Spray-Textured Ceilings: Where water-based texturing materials or any slow-drying surface treatment are used over single-layer panels, maximum frame spacing is 16 inches o.c. for ½ inch panels applied perpendicular to framing.
  13. Expansion Joints: Provide a separation in the suspension system at expansion joints as shown on the drawings and carry the joint through the gypsum panels. Install expansion joints to separate the suspension system and allow for movement in large ceiling areas. Ceiling areas shall not exceed 50 ft. (2500 sq. ft.) with perimeter relief or 30 ft. (900 sq. ft.) without perimeter relief.
- C. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 16 inches on center. Fill interstitial space between furring channels with rigid board insulation.
1. Orientation: Horizontal.
  2. Spacing: At 16 inches on center.
- D. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
- E. Fire blocking and furring for Fire Ratings: Install under provisions of Section 06100 as required by prevailing codes to provide fire resistance ratings indicated and to GA-600 requirements.
- F. Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, framed openings, toilet accessories, hardware, other wall mounted fixtures or equipment, and as necessary to provide solid edge blocking for fire-rated installations and support of board materials.
1. Comply with Section 06 1000 for wood blocking.
  2. Bolt or screw steel backing to metal framing substrates.

### 3.04 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
1. Place one bead continuously on substrate before installation of perimeter framing members.
  2. Place continuous bead at perimeter of each layer of gypsum board.
  3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

### 3.05 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer



perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

- D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- F. Impact Resistant Gypsum Board: Install as for gypsum board. Do not install over faced insulation or other vapor-retarders.
- G. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
  - 1. Seal joints, cut edges, and holes with water-resistant sealant.
- H. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
- I. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
- J. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
  - 1. Single-Layer Applications: Screw attachment.
  - 2. Double-Layer Applications: Install base layer using screws. Install face layer by screws.
- K. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.
- L. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.

### 3.06 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as directed.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

### 3.07 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C 840, and required by Section 09 9000 Painting and Coating, as follows:
  - 1. Level 5: Corridor walls to receive eggshell paint finish.
  - 2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
  - 3. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 4. Level 3: Walls to receive textured wall finish.
  - 5. Level 3: Ceilings to receive glued on acoustical ceiling tiles.
  - 6. Level 2: Behind cabinetry and on backing board to receive tile finish.

7. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

### **3.08 TEXTURE FINISH**

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
- B. Texture Required: .
  1. Finish Texture: Medium Orange Peel at walls and ceiling unless otherwise noted.
  2. No finish texture at Level 5 joint treatment walls and ceilings as noted.

### **3.09 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board, Tack Board, or Cementitious Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

**SECTION 09 5153**  
**DIRECT-APPLIED ACOUSTICAL CEILINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Acoustic units.
- B. Perimeter trim.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.

**1.03 REFERENCE STANDARDS**

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.
- B. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2005 (Reapproved 2012).
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.
- D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
- E. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- F. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustic units after interior wet work is dry.

**1.05 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Product Data: Provide data on acoustic units and accessories.
- C. CAL-GREEN Submittals: Product Data - VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.
- D. Shop Drawings: Indicate tile layout and related junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system and other ceiling-related work.
- E. Samples: Submit two samples, of manufacturer's standard size, illustrating material and finish of acoustic units.

- F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Acoustical Units: Quantity equal to 5 percent of total installed

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum five (5) years of documented experience.

#### **1.07 PROJECT CONDITIONS**

- A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustic units after interior wet work is dry.
- C. Maintain uniform temperature and humidity not exceeding the manufacturer's outside limits prior to, during, and after installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Direct Applied Acoustical Ceilings:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com/#sle](http://www.armstrong.com/#sle).
  - 2. USG: [www.usg.com/#sle](http://www.usg.com/#sle).
- B. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 MATERIALS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Acoustic Tile, Direct Applied: Mineral Fiber, wet-formed, factory-applied scrim, ASTM E1264, Type IV, Form 2, Pattern E.
  - 1. Size: 24 x 48 inches.
  - 2. Thickness: 3/4 inch minimum.
  - 3. Noise Reduction Coefficient (NRC): 0.75 when tested in accordance with ASTM C423 for Type direct-applied mounting, per ASTM E795.
  - 4. Fire Hazard Classification: ASTM E84 Class A (Flame Spread 25 or under), UL Labeled.
  - 5. Surface Burning Characteristics: Flame spread index of 0-25, smoke developed index of 0-50, when tested in accordance with ASTM E84.
  - 6. Humidity/Sag Resistance: HumiGuard® Plus.
  - 7. Anti-Mold/Mildew: BioBlock® performance resist the growth of mold and mildew on the tile surface. Disinfectable CleanAssure™.
  - 8. VOC Emissions: GreenGuard Gold Certified with California Dept. of Public Health CDPH/EHLB Standard Method.
  - 9. Recycled Content: Exceed 50% total recycled content.
  - 10. Edge: Square.

11. Surface Color: As selected by Architect. Provide Theater Black at Darkroom locations and colors as selected at other locations, minimum of two colors required.
  12. Surface Pattern/Finish: Smooth.
  13. Product:
    - a. Armstrong; INVISACOUSTICS™; www.armstrongceilings.com.
    - b. Certainteed, ECOPHON® FOCUS™ B, F, SQ; www.certainteed.com/ceilings.
    - c. Substitutions: Section 01 6000.
- C. Acoustic Tile, Direct Applied: Fiberglass with plant-based binder, acoustically transparent membrane with factory-applied latex paint, ASTM E1264, Type XII, Form 2, Pattern E.
1. Size: As indicated
  2. Thickness: 1 inch minimum.
  3. Light Reflectance: 0.88.
  4. Noise Reduction Coefficient (NRC): 0.95 when tested in accordance with ASTM C423 for Type direct-applied mounting, per ASTM E795.
  5. Fire Hazard Classification: ASTM E84 Class A (Flame Spread 25 or under), UL Labeled.
  6. Surface Burning Characteristics: Flame spread index of 0-25, smoke developed index of 0-50, when tested in accordance with ASTM E84.
  7. Humidity/Sag Resistance: HumiGuard® Plus.
  8. Anti-Mold/Mildew: BioBlock® performance resist the growth of mold and mildew on the tile surface. Disinfectable CleanAssure™.
  9. VOC Emissions: GreenGuard Gold Certified with California Dept. of Public Health CDPH/EHLB Standard Method.
  10. Recycled Content: Exceed 50% total recycled content.
  11. Edge: Square.
  12. Surface Color: As selected by Architect. Provide Theater Black at Darkroom locations and colors as selected at other locations, minimum of two colors required.
  13. Surface Pattern/Finish: Smooth.
  14. Product:
    - a. Armstrong; LYRA® PB; www.armstrongceilings.com.
    - b. Substitutions: Section 01 6000.
- D. Acoustic Tile, Direct Applied: Mineral Fiber, wet-formed, factory-applied latex paint, ASTM E1264, Type III, Form 2, Pattern C E.
1. Size: 12 by 12 inches.
  2. Thickness: 1/2 inch minimum.
  3. Density:
  4. CAC: NA
  5. Light Reflectance: 0.82.
  6. Noise Reduction Coefficient (NRC): 0.55 when tested in accordance with ASTM C423 for Type direct-applied mounting, per ASTM E795.
  7. Fire Hazard Classification: ASTM E84 Class A (Flame Spread 25 or under), UL Labeled.
  8. Surface Burning Characteristics: Flame spread index of 0-25, smoke developed index of 0-450, when tested in accordance with ASTM E84.
  9. Humidity/Sag Resistance: HumiGuard® Plus.
  10. Anti-Mold/Mildew: BioBlock® performance resist the growth of mold and mildew on the tile surface. Disinfectable CleanAssure™.
  11. VOC Emissions: GreenGuard Gold Certified with California Dept. of Public Health CDPH/EHLB Standard Method.
  12. Recycled Content: Exceed 50% total recycled content.
  13. Edge: Beveled, tongue and groove.
  14. Surface Color: As selected by Architect.
  15. Surface Pattern/Finish: Non-directional fissured.

16. Product:

- a. Armstrong; Fine Fissured® 741.
- b. USG Corporation; Radar™ 2570.
- c. Substitutions: Section 01 6000.

- E. Adhesive: Waterproof, gun grade; type recommended by tile manufacturer.
- F. Perimeter Moldings: Rolled steel profile, white color.
- G. Acoustic Sealant for Perimeter Moldings: Acrylic emulsion latex or water-based elastomeric sealant of type recommended by tile manufacturer and meeting requirements of Section 07 9200; do not use solvent-based non-curing butyl sealant.

**2.03 FINISHES**

- A. Acoustic Tile and Perimeter Trim Color(s) as selected by Architect from:
1. Manufacturer's full range of standard colors.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.

**3.02 INSTALLATION**

- A. Install system in accordance with manufacturer's instructions.
- B. Perimeter Molding:
1. Install concealed edge molding at intersection of ceiling and vertical surfaces into bed of acoustic sealant.
  2. Use longest practical lengths.
  3. Miter corners.
  4. Provide concealed molding at junctions with other interruptions.
- C. Center tile on room axis leaving equal border units.
- D. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
- E. Install acoustic units level in uniform plane.

**3.03 TOLERANCES**

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

**END OF SECTION**

**SECTION 09 9123**  
**INTERIOR PAINTING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Materials for backpriming woodwork.
- D. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
  - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
  - 2. Prime surfaces to receive wall coverings.
  - 3. Mechanical and Electrical:
    - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
    - b. In finished areas, paint shop-primed items.
    - c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
    - d. Paint dampers exposed behind louvers, grilles, and convactor and baseboard cabinets to match face panels.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.

**1.03 DEFINITIONS**

- A. Comply with ASTM D16 for interpretation of terms used in this section.

**1.04 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. Manufacturer's recommendations and specifications, including installation instructions.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, [www.paintinfo.com](http://www.paintinfo.com).
- E. SSPC-SP 1 - Solvent Cleaning; 2015.
- F. SSPC-SP 2 - Hand Tool Cleaning; 2018.
- G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
- H. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.

- I. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code, "CAL-Green".

#### 1.05 SUBMITTALS

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
  1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
  2. MPI product number (e.g. MPI #47).
  3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
  4. Manufacturer's installation instructions.
  5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
  6. Resin Type.
  7. Total VOC Content in grams per liter.
  8. Solids Content By Volume SCBV (not solids by weight). All products shall be minimum 35% SCBV.
  9. Composition-By-Weight. Demonstrate composition by percentage related to total weight of all components.
  10. Film Thickness Per Coat, Wet and Dry.
  11. Prime Pigment: Demonstrate prime pigment by percentage related to total volume of all components.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
  1. Where sheen is specified, submit samples in only that sheen.
  2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
  3. Allow 30 days for approval process, after receipt of complete samples by Architect.
  4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as factory finished metals, wood cabinets, wood doors, and wall coverings and tile, have been approved.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
  3. Label each container with color in addition to the manufacturer's label.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten (10) years documented experience.



- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five (5) years experience and approved by manufacturer.

#### **1.07 MOCK-UP**

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 8 feet long by 10 feet wide, illustrating paint color, texture, and finish.
- C. Provide door and frame assembly illustrating paint color, texture, and finish.
- D. Locate where directed by Architect.
- E. Final color selections and acceptance will be made only after review of mock-ups under lighting conditions approximating finish conditions.
- F. Mock-up may remain as part of the work.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

#### **1.09 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

### **PART 2 PRODUCTS**

#### **2.01 DESIGN REQUIREMENTS**

- A. Design Intent: Paint all exposed surfaces of Work, whether or not the item or surface is specifically identified within the Contract Documents.
  - 1. The number of coats specified is the minimum to be applied. Provide paint finishes of even, uniform color, free from cloudy or mottled surfaces. Provide one additional coat if necessary where "deep colors" are selected.
  - 2. Non-scheduled items: Provide manufacturer's approved and recommended system as set forth in Manufacturer's "Specifications Architectural Finishes".

#### **2.02 MANUFACTURERS**

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
  - 1. Benjamin Moore & Co: [www.benjaminmoore.com](http://www.benjaminmoore.com).
  - 2. Dunn Edwards; [www.dunnedwards.com](http://www.dunnedwards.com).
  - 3. Kelly-Moore: [www.kellymoore.com](http://www.kellymoore.com).
  - 4. Sherwin-Williams Company: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).

- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 6000 - Product Requirements.

### 2.03 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
  - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  - 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
  - 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
  - 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.
- C. Flammability: Comply with applicable code for surface burning characteristics.
- D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- E. Colors: To be selected from manufacturer's full range of available colors.
  - 1. Selection to be made by Architect after award of contract.
  - 2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
  - 3. Extend colors to surface edges; colors may change at any edge as directed by Architect.
  - 4. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
  - 5. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

### 2.04 PAINT SYSTEMS - INTERIOR - METALS

- A. Paint MI-OP-3A - Ferrous Metals, Primed or Unprimed, Alkyd, 3 or 4 Coat:
  - 1. One coat of alkyd primer:
  - 2. Two (or more) coats of Alkyd Enamel, as required to achieve specified appearance. Provide sheen as specified and number of coats as required to achieve specified appearance; Gloss ( Handrails and Guardrails), Semi-gloss (All other surfaces). Sheen selected by Architect.
  - 3. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  - 4. Dunn Edwards Products:
    - a. BLOC-RUST Premium BRPR00 Red or White Oxide, as required for finish color selection.
    - b. One coat or as required to achieve specified appearance, ARISTOSHIELD Series High-Gloss ASHL70 Water-Oil Hybrid Int/Ext, or as required for specified sheen.
  - 5. Kelly-Moore Products:
    - a. Rust-Oleum CV740, Alkyd Metal Primer.

- b. Two coats, 1999 Epic Water Urethane Modified Alkyd Gloss Enamel or as required for specified sheen.
- B. Paint MI-OP-3L - Ferrous Metals, Primed or Unprimed, Latex, 3 Coat: Surfaces 8 feet or more above finish floor, trusses, metal roof deck, ductwork.
  1. One coat of alkyd primer:
  2. 2 coats of latex enamel; sheen as selected by Architect.
  3. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  4. Dunn Edwards:
    - a. BLOC-RUST Premium Red or White Oxide, as required for finish color selection.
    - b. EVERSIELD EVSH60 100% Acrylic Gloss Enamel Series or SPARTAWALL SWLL50, as required for specified sheen.
  5. Kelly-Moore Products:
    - a. Rust-Oleum CV740 Alkyd Metal Primer.
    - b. KM 1680 Series DURA-POXY + 100% Acrylic Enamel or 1650 ACRY-PLEX Low VOC Interior 100% Acrylic Semi-Gloss Enamel as required for specified sheen.
- C. Paint MgI-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
  1. Pretreatment: reduce to minimum level for finish coat adhesion.
  2. One coat alkyd metal primer.
  3. Two coats of alkyd enamel, sheen as selected by Architect.
  4. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  5. Dunn-Edwards Products:
    - a. DE Krud Kutter Metal Clean and Etch.
    - b. DE ULTRASHIELD Galvanized Metal Primer ULGM00.
    - c. DE ARISTOSHIELD ASHL70 Water-Oil Hybrid Int/Ext Series, High-Gloss or as selected by Architect.
  6. Kelly Moore Products:
    - a. Krud Kutter Metal Clean and Etch.
    - b. KM 5725 DTM Primer / Finish.
    - c. KM1998 / 1999 Epic Water Urethane Modified Alkyd Gloss Enamel.
- D. Paint MgI-OP-3L - Galvanized Metals, Latex, 3 Coats: Surfaces 8 feet or more above finished floor, metal roof deck, ductwork, etc.
  1. Pretreatment: Solvent wash to remove oily residue, ensure finish coat adhesion.
  2. One Coat Galvanized Primer.
  3. Two Coats Latex Enamel; sheen as selected by Architect
  4. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  5. Dunn-Edwards Products:
    - a. Pretreatment as recommended by topcoat manufacturer.
    - b. DE ULTRASHIELD Galvanized Metal Primer ULGM00.
    - c. DE SPARTASHIELD SSSL60 Series 100% Acrylic Enamel, as required for specified sheen.
  6. Kelly Moore Products:
    - a. Pretreatment as recommended by topcoat manufacturer.
    - b. KM 5725 DTM Acrylic Primer / Finish.
    - c. KM : 1680 DURA-POXY + 100% Acrylic Gloss Enamel, as required for specified sheen.

## 2.05 PAINT SYSTEMS - INTERIOR - WOOD

- A. Paint WI-OP-3L - Wood, Opaque, Latex, Low-VOC 3 Coat: Cedar, redwood, architectural glue-laminated beams, typical interior wood trim with opaque finish. Provide number of coats necessary for stain resistance and uniform color.
  - 1. One coat of latex primer sealer.
  - 2. Two coats of latex enamel; . Sheen selected by Architect.
  - 3. Dunn-Edwards Products:
    - a. DE INTER-KOTE Wood Primer IKPR00.
    - b. DE SPARTAWALL 100 % Acrylic Semi-Gloss SWLL50 Series.
  - 4. Kelly-Moore Products:
    - a. KM 973 Acryplex Low VOC Interior Enamel Undercoat.
    - b. KM 1050 Series Premium Professional Low VOC Interior Acrylic Latex.
- B. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat: Typical exposed interior beams above 8'-0".
  - 1. One coat of latex primer sealer.
  - 2. Two coats of latex enamel. Sheen selected by Architect.
  - 3. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  - 4. Dunn-Edwards Products:
    - a. Dunn-Edwards: INTER-KOTE Premium IKPR00.
    - b. Dunn-Edwards: SPARTAWALL SWLL30.
  - 5. Kelly-Moore Products:
    - a. Kelly-Moore: 973 Acry-Plex Zero VOC Interior Undercoat .
    - b. Kelly-Moore: "KM 1010 Premium Professional Zero VOC Eggshell Enamel".
- C. Wood to Receive Transparent Finishes: Finish as specified in related Section 09 9300.

## 2.06 PAINT SYSTEMS - INTERIOR - GYPSUM AND PLASTER

- A. Paint GI-OP-3E - Gypsum Board, Plaster, Epoxy, 3 Coat:
  - 1. One coat of synthetic resin primer sealer, quick dry, pigmented.
  - 2. Two coats of two-component acrylic epoxy enamel; Semi-gloss sheen, or as selected by Architect.
  - 3. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  - 4. Dunn Edwards Products:
    - a. DE Vinylastic W101.
    - b. DE Rustoleum S-50.
  - 5. Kelly Moore Products:
    - a. KM MonoChem Aqua Prime Primer
    - b. KM MonoChem 200 WB Epoxy Coating
- B. Paint GI-OP-3A-L Gypsum Board/Plaster, Acrylic, Low-VOC, 3 Coat:
  - 1. One coat of low odor/low-VOC vinyl acrylic primer sealer: pigmented.
  - 2. Two coats of low odor / low-VOC acrylic, sheen as selected by Architect.
  - 3. Note: Surfaces that prepared to a Level 5 Finish, using the Level 5 Primer/Prep Coat as specified in Section 09 2116 "Gypsum Board Assemblies", may omit primer coat specified above when topcoat manufacturer confirms in writing that this primer is compatible with the finish coats as specified.
  - 4. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  - 5. Dunn-Edwards Products:
    - a. DE VINYLASTIC Premium VNPR00.

- b. DE SPARTAWALL 100 % Acrylic Semi-Gloss SWLL50 Series as required for specified sheen.
  6. Kelly Moore Products:
    - a. KM 971 Acry-Plex Low VOC Interior PVA Primer/Sealer.
    - b. KM 1010 Premium Professional Interior 100% Acrylic Enamel Series, as required for specified sheen.
- C. Paint GI-P-1A - Gypsum Board/Plaster, Alkyd Primer, 1 Coat: Preparation for application of Wall Covering.
  1. One coat of primer sealer.
  2. If any of the products below are discontinued, submit alternate products approved by the Manufacturer in writing.
  3. Dunn-Edwards Products:
    - a. DE ZINSSER Shieldz Universal Wallcovering Primer.
  4. Kelly Moore Products:
    - a. KM 265 Water-Oil Hybrid Int/Ext Primer Undercoat.

## 2.07 PRIMERS

- A. Primers: As required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
  1. If products specified are discontinued, submit alternate product approved by specified Manufacturer in writing.

## 2.08 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Sanding materials: 120-180 grit, for architectural woodwork, finish carpentry, wood doors, or other surfaces requiring touch-up.
- C. Patching Material: Latex filler.
- D. Fastener Head Cover Material: Latex filler.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the manufacturer-recommended maximums.

### 3.02 PROTECTION OF ADJACENT WORK

- A. Protect surrounding elements from damage from painting procedures. Provide temporary facilities and barricades required. Additional requirements specified in Division 01.
- B. Carefully remove and store removable items located in areas to be painted, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
- C. Separate areas to be protected from painting areas using means adequate to prevent damage.
- D. Cover existing interior planters and landscaping with tarpaulins or similar covers.
- E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.

### 3.03 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- I. Tackable Substrates for Wall Coverings: Prepare as for gypsum board.
- J. Galvanized Surfaces:
  - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
  - 2. Prepare surface according to SSPC-SP 2.
- K. Ferrous Metal:
  - 1. Solvent clean according to SSPC-SP 1.
  - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
  - 3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.
- L. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- M. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
- N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

### 3.04 PREPARATION - EXISTING SURFACES

- A. General: As specified above and as follows below.
- B. Remove or repair existing coatings that exhibit surface defects. Feather-edge patches to make finished edges inconspicuous.
- C. Existing Cement Plaster Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Surfaces to be clean, dry, free of dirt, dust, grease, oil, mildew, efflorescence and other contaminants affecting paint adhesion or performance. Completely remove all loose, peeling or checked paints by power-washing, scraping or other methods. Spot-prime and point-up cracks, voids or other surface fissures by methods recommended by paint manufacturer. Spot-prime again following patching. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- D. Existing Gypsum Board Surfaces to be Painted: Remove dirt, loose texturing, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Surfaces to be clean, dry, free of dirt, dust, grease, oil, mildew, efflorescence and other contaminants affecting paint adhesion or performance. Completely remove all loose, peeling or checked paints by sanding, scraping or other methods. Fill all holes and defects with suitable patching or spackling material compatible with the substrate material, allow to completely dry and sand to approximate existing adjacent textures. Spot prime patched areas.
- E. Existing Metal Surfaces With Existing Coatings to be Recoated; sheet metal flashings and trim, hollow metal doors, frames, columns and similar items. Sand and scrape to remove existing finishes, loose primer and rust. Clean surfaces with solvent. Prime bare metal surfaces. Feather edges to make touch-up patches inconspicuous.
- F. Existing Wood to Receive Opaque Finish: Completely remove all loose, peeling chalking, flaking or peeling paint by pressure-washing, scraping, wire brushing, sanding or other appropriate methods which will not damage existing substrates or adjacent finishes. Dull glossy surfaces to provide roughened surface for proper adhesion. Remove all loose sealant and glazing compounds. Feather back rough paint edges and weathered wood material by sanding. Spot prime all areas before and after application of new sealants, patching or glazing materials. Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior sealant compound after prime coat has been applied. Remove mildew growth as recommended by paint manufacturer.
- G. Existing Metal Doors to be Painted Sand, patch, clean with solvent. Prime metal door top and bottom edge surfaces. Finish otherwise as for Existing Metal Surfaces With Existing Coatings to be Recoated.

### 3.05 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

- E. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- G. Sand wood and metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **3.06 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

### **3.07 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

### **3.08 PROTECTION**

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

### **3.09 SCHEDULE - SURFACES NOT REQUIRING PAINTING BY THIS SECTION**

- A. Do Not Paint or Finish the Following Items:
  - 1. Items factory-finished except those specifically noted in this section to be finished; materials and products having factory-applied primers are not considered factory finished.
  - 2. Equipment, ductwork, conduit and electrical items, with factory finishes suitable for interior exposure, where concealed from public or occupant view in custodial or utility spaces.
  - 3. Items indicated to receive other finishes.
  - 4. Items indicated to remain unfinished.
  - 5. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
  - 6. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead items.
  - 7. Marble, granite, slate, and other natural stones.
  - 8. Ceramic and other types of tiles.
  - 9. Pre-finished wall, ceiling, roof and floor materials or coverings, unless specifically scheduled for field painting, including, but not limited to:
  - 10. Floors, unless specifically indicated.
  - 11. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco unless specifically indicated.
  - 12. Glass.
  - 13. Concealed pipes, ducts, and conduits.



### 3.10 SCHEDULE - SURFACES TO BE FINISHED

- A. General: Paint the surfaces described below under Schedule - Paint Systems. All surfaces exposed to interior atmosphere, or visible to the eye, unless specifically excluded by the Article titled "Do Not Paint or Finish the Following Items". If a coating system is not specified for a particular surface or substrate, provide a three-coat finish system recommended by the paint or coating manufacturer for that surface or substrate. Include all preparation necessary as appropriate for a similar substrate listed in the Article titled "PREPARATION", or preparation for that substrate as recommended by the paint or coating manufacturer.
- B. Mechanical and Electrical: Use paint systems defined for the materials to be finished.
  - 1. Paint all conduit, insulated and exposed pipes, boxes, hangers, brackets, collars and supports, mechanical equipment, electrical equipment, and exposed ducts occurring in finished areas to match background surfaces, unless otherwise indicated.
  - 2. Paint shop-primed items occurring in finished areas.
  - 3. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
  - 4. Paint dampers exposed behind louvers, grilles, to match face panels.
- C. Paint behind moveable equipment and furniture.
- D. Finish top, bottom, and side edges of interior doors the same as exposed faces.
- E. Paint access doors, fire hose and extinguisher cabinets, panelboards, conduits and exposed plumbing piping.
- F. Paint exposed metal decks.
- G. Paint reveal moldings, expansion joints, and handrails.
- H. Paint tube column and miscellaneous connections.
- I. Provide split finishes for painted doors and interior windows where different connected room colors are selected.
- J. Paint continuous surfaces with the same paint system. Do not change systems at elevation breaks.
- K. Touch-up factory paint finishes where damaged.
- L. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

### 3.11 SCHEDULE - INTERIOR PAINT SYSTEMS

- A. Gypsum Board: Finish all surfaces exposed to view, GI-OP-3A..
  - 1. Interior Ceilings and Bulkheads: Flat sheen.
  - 2. Interior Walls: Semi-gloss Sheen at Toilet Rooms, Custodians, Storage Room, Food Service.
  - 3. Interior Walls: Eggshell at Classrooms, Corridors, Administrative Offices and Work Rooms.
- B. Wood: Finish all surfaces exposed to view.
  - 1. Interior Opaque Finish: WI-OP-3L
    - a. Trim and frames: Semi-gloss sheen.
    - b. Beams: Low Sheen.
- C. New Wood Doors: Factory-finished.

- D. New Fiberglass Doors: Factory-finished.
- E. Steel Doors and Frames: Finish all surfaces exposed to view and to weather, including door tops and bottoms. Select prime coats compatible with finish color selections. MI-OP-3A.
  - 1. Semi-gloss sheen.
- F. Metal Fabrications, Galvanized Steel and Shop-Primed Metal Items: Finish all surfaces exposed to view and concealed, before installation, including exposed portions of metal roof or floor deck assemblies.. Select prime coats compatible with finish color selections. MI-OP-3A for surfaces under 8 feet above floor. MI-OP-3L for surfaces over 8 feet above floor.
  - 1. Interior - Handrails and exposed spiral seamed ductwork: Gloss sheen.
  - 2. Interior - All Other Surfaces: Semi-gloss sheen.
- G. Exposed Interior Steel with Intumescent Mastic Fireproofing: Finish all surfaces MI-IT-3A, Gloss.
- H. Miscellaneous metals, conduits, non-factory-finished access panels: As specified for either unprimed or shop primed metals, modified as required to make sheen match adjacent surfaces.
  - 1. Finish the following items:
    - a. Exposed portions of metal roof and floor deck assemblies.
    - b. Exposed surfaces of lintels.
    - c. Exposed surfaces of steel stairs, ladders, fences, gates and railings.
    - d. Mechanical equipment.
    - e. Electrical equipment.
- I. Wall and Substrate Surfaces Under Wall Covering: GI-P-1A.

### 3.12 SCHEDULE - COLORS

- A. Interiors, allow individual schedule for each Building:
  - 1. Walls; Field color as selected.
  - 2. Ceilings/soffits; as selected, allow for deep tones.
  - 3. Wainscot; as selected, allow for deep tones.
  - 4. Accent walls; as selected, allow for deep tones.
  - 5. Paint access doors and panels same as walls and wainscots.
  - 6. Wood Trim; as selected, allow for deep tones.
  - 7. Accent members; as selected, allow for deep tones.
  - 8. Doors and Frames; as selected, allow for deep tones and split finishes exterior/interior.
  - 9. Doors and Frames for Utility or staff access only, as selected; match walls/wainscot.
  - 10. Guardrails, handrails; as selected.
  - 11. Exposed trusses or structural members; as selected, allow for deep tones.
  - 12. Exposed ductwork; as selected, allow for deep tones.
  - 13. Mechanical or other equipment exposed to view; as selected or match wall/wainscot as directed.

END OF SECTION

## SECTION 23 0000

### HEATING, VENTILATING, and AIR CONDITIONING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. The requirements of Section 23 0500 - General Mechanical apply to all work herein.
- B. Section includes furnishing and installation of complete "Heating, Ventilating, Air Conditioning" systems, including but not necessarily limited to the following:
  - 1. Demolition of existing ductwork and equipment as indicated on the Drawings
  - 2. Variable Refrigerant Flow (VRF) heat recovery air conditioning system outdoor unit connected to indoor units and branch selectors
  - 3. Multiposition fan coil indoor units
  - 4. 4-way ceiling cassette indoor units
  - 5. Wall mounted evaporator split system
  - 6. Ceiling mounted ventilation fan(s)
  - 7. Remote mounted fresh air supply fans
  - 8. Gravity intake and relief ventilators
  - 9. Air terminals
  - 10. Thermal insulation for all piping and ductwork supplied under this Section
  - 11. Refrigerant piping and appurtenances
  - 12. Condensate drainage piping and connections from points of attachment to equipment to indirect waste locations, as indicated on the Drawings (PLUMBING)
  - 13. Ductwork, inclusive of all air turns, dampers, grilles, diffusers, fire dampers, sound traps, supports, bracing and fresh air/combustion air ducts
  - 14. Flashings, curbs and caps in connection with all equipment, piping, and ductwork supplied under this Section
  - 15. Temperature control wiring and control devices
  - 16. Start up, adjusting, and balancing.
- C. Related Sections
  - 1. Section 07 6200 - Sheet Metal Flashing and Trim
  - 2. Section 07 9200 - Joint Sealants
  - 3. Section 09 9123 - Interior Painting
  - 4. Section 23 0500 - General Mechanical
  - 5. Section 23 0593 - Testing, Adjusting and Balancing for HVAC
  - 6. Section 23 0923 - Controls for HVAC
  - 7. Section 26 0500 - Basic Electrical Requirements
  - 8.
- D. The Contractor shall furnish all materials and labor under the scope of the Contract, unless otherwise noted. Anything accepted as standard trade practice reasonably incidental to the completion of the system shall be furnished without additional cost to the Owner. The Contractor shall understand that the work herein described shall be complete in every detail, notwithstanding every item necessarily involved is not particularly mentioned, and the Contractor shall be held to provide all labor and material necessary for the entire completion of the work.
- E. Comply with applicable requirements of ASHRAE 62.1 and ASHRAE 90.1.

## 1.02 SUBMITTALS

- A. All submittals shall be in accordance with the requirements of Division 01 Sections and the following.
- B. Product Data
  - 1. For each type of product indicated, include manufacturer's specifications, data sheets, and certified drawings on major equipment. Include physical and performance data such as weights, sizes, capacities, required clearances, performance curves, acoustical characteristics, finishes, color selection, and accessories.
  - 2. Include certified drawings on major equipment.
- C. Coordinated Layout / Shop Drawings
  - 1. Prepare complete consolidated and coordinated layout drawings for all new systems, and for existing systems that are in the same areas. Shop drawings shall be prepared using AutoCAD 2012 or newer and shall be drawn at a minimum  $\frac{1}{4}'' = 1' - 0''$  scale.
  - 2. All drawings shall be fully coordinated with HVAC, Plumbing, Fire Protection, Electrical, Structural, and Architectural work. Drawings shall be coordinated and dimensioned indicating equipment, pipe, duct, fire protection, and electrical in relation to architectural and structural features. Indicate exact locations of valves, piping specialties, access doors, etc.
  - 3. Clearly identify and dimension the proposed locations of the principal items of equipment and adequate clearance for all equipment, piping, pumps, valves and other items. Provide detailed layout of all piping systems showing the proposed routes.
  - 4. Show the access means for all items requiring access for operations and maintenance.
  - 5. Submit shop drawings to Architect for approval, prior to fabrication or installation of any work. Do not install equipment or piping until drawings have been approved. Any work installed without prior shop drawing approval shall be removed at the Contractor's expense.
  - 6. Use of contract documents for shop drawings is not acceptable.
- D. Shop-wiring diagrams of temperature controls and air conditioning unit controls.
- E. Equipment manufacturer shall design, construct, and certify that his equipment satisfies the special minimum seismic resistance requirements for this project and shall submit calculations or test results supporting his certification.
- F. Field quality-control test reports.
- G. Operation and maintenance data
  - 1. Contractor shall provide all operating and maintenance instructions provided by the manufacturer, describing proper operation and maintenance of any equipment and devices installed. Operating and maintenance instructions shall cover maintenance, adjustment, and operation of each piece of apparatus.
  - 2. Contractor shall also provide a parts list of all equipment and component parts for all equipment under this Section. The equipment list shall include manufacturer's name, model number, and local representative, service facilities and normal channel of supply for each item.
  - 3. Data shall include a table of contents identifying items therein, and index tabs for each system. Neatly obscure or cross out inapplicable data from manufacturer's literature. Include the following:
    - a. Manufacturer's brochures, ratings, certified shop drawings, lubrication charts and data, and parts list with part numbers. Mark each sheet with equipment identification number and actual installed condition or system and location of installation. Specifically identify which options are provided.

- b. Description of start-up and operating procedures for each system, including controls diagrams and description of operating sequences.
- c. Recommend preventative maintenance schedule and procedures.
4. Submit data to the Architect for approval. Final acceptance of the work will not be made until a satisfactory submission of this material is received and approved by the Architect.

H. As-built Drawings

1. Complete and detailed shop drawings shall be maintained throughout the coordination and construction phase, indicating all equipment and trades' work clearly. All equipment including piping, etc. shall clearly identify both top and bottom elevations as well as distances from equipment to established building lines. Coordinate with other trades and field conditions and show dimensions and details including building construction and access for servicing. All changes in the work shall be recorded on this set on a daily basis. In addition to changes made during course of work, show the following:
  - a. Exact location, type and function of concealed valves and controllers.
  - b. Exact size, elevations and location of underground and under floor piping.
2. Submit to Architect for approval.

I. Warranty

1. Equipment warranties shall be provided for all equipment, with all necessary information filled in, except purchase date, in favor of the Owner.

J. Refer to mechanical equipment specified herein for additional requirements

**1.03 DEMONSTRATION & TRAINING**

- A. The Owner's authorized representative shall be instructed in the operation and servicing of all heating, ventilating, and air conditioning systems, subsystems, and equipment.
  1. Provide a minimum of 4 hours of instruction time. All instruction shall be provided at no cost to the Owner.

**PART 2 PRODUCTS**

**2.01 REFRIGERANT PIPING AND APPURTENANCES**

- A. Refrigerant piping shall be Type "ACR" ASTM B 280, drawn temper, seamless copper tube.
- B. Pipe fittings and unions shall be wrought copper with brazed joints. ASME B16.22. Mechanical joints on refrigerant piping are prohibited. All refrigerant piping joints shall be brazed. Lead-free silver brazing alloy, minimum 15% silver content. Harris "Stay-Silv® 15" or equal.
- C. Flexible connectors shall be bronze, double braided, with inlet and outlet connections as required. Metraflex RAF series or equal.
- D. Sight glasses shall be color change moisture indication type, replaceable element, filter screen and pad, sweat solder ends; Sporlan "See-All", Henry, or equal.
- E. Charging and purge valves shall be forged brass, diaphragm packless, globe type, angle or straight through, one end solder, one end flare. Henry 623 and 643 series, Sporlan, or equal.
- F. Solenoid valves shall be of forged brass, extended solder end connections, molded coil. Sporlan "E" series or equal. ARI 760 & UL 429
- G. Isolation/shut off valves shall be Mueller Streamline "Cyclemaster" series ball valves or equal. 700 psig maximum working pressure. Valves shall be compatible with all CFC, HCFC and HFC refrigerants and oils, be full port construction to match line size ID, and shall have internally equalized ball design, rupture proof encapsulated stem, and be UL Listed and CE Certified. -40°F/300°F working temperature range.

- H. Filter driers shall be replaceable media, angle type. Henry "Dri-Cor" or equal. ARI 730
- I. Electronic thermostatic expansion valves shall have stainless steel body and connections, ceramic slide and port, linear flow capacity, continuous modulation, and direct coupling of motor and valve. Emerson "EX" series or equal.
- J. Expansion loops shall be Metraflex "VRF Metraloop" or equal. Loop shall be constructed of two parallel sections of corrugated Type 321 stainless-steel metal hose, Type 304 stainless-steel braid, 180° return bend with factory supplied hanger support lug at bottom, and inlet and outlet connections. Fittings shall be Schedule 40 S Type 304 stainless-steel. The loop shall be equipped with stainless-steel to copper conversion fitting with XHP copper stub ends for copper pipe systems.
  - 1. Provide as required to accommodate any thermal expansion or contraction or as indicated on the Drawings. Return fitting shall be supported to allow movement.
- A. Pipe hangers: All refrigerant piping shall be supported 8' on center and within 2 feet of a change in direction of piping. Piping shall be supported at points not more than 15 feet apart.
- K. Split system fan-coil units and heat pump units shall have brazed sweat-fitting connections on the refrigerant piping between the units with a flexible piping section at the outdoor unit.

## 2.02 CONDENSATE DRAINAGE PIPING

- A. Condensate drainage piping - Mueller Streamline, Cerro Flow, or equal.
  - 1. 1 ¼" and larger shall be type DWV, drawn temper seamless copper tube, ASTM B306 with wrought copper or cast brass fittings. Wrought copper fittings shall comply with ASME B16.29.
  - 2. 1" and smaller shall be type M, drawn temper, seamless copper tube, ASTM B88 with standard pressure fittings.
- B. Drainage fittings shall be ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings. 1 ¼" & smaller, standard pressure fittings.
- C. Acidic condensate drainage pipe and fittings shall be Schedule 40, NSF-14, ASTM 439, socket fittings, solvent weld CPVC.
- D. Joints shall be made up with lead free solder, ASTM B32 Alloy B. Harris "Bridgit® Lead-Free Solder", Lucas Milhaupt "Silvabrite 100", or equal

## 2.03 VALVES

- A. General Requirements:
  - 1. All valves, except pressure reducing and control valves, shall be the same size as the pipe to which they are installed.
  - 2. All valves of a particular type and size range shall be the product of one manufacturer.
  - 3. Valve body materials shall be compatible with piping system materials.
  - 4. Provide a union immediately downstream from each valve, unless the valve is flanged.
  - 5. All valves shall be installed with the stem 45 degrees above horizontal, if possible. In no case shall the stem be installed below horizontal.
  - 6. Where insulation is indicated, install extended stem valves arranged in proper manner to receive insulation.
- B. Ball Valves (solder): Nibco T-685-80, Watts B-6080, or KITZ 58; two-piece, full port, lever handle, 600 psi CWP.

## 2.04 UNIONS

- A. Unions or flanges shall be furnished and installed at each threaded connection to all equipment

or valves. The unions shall be located so that the piping can be easily disconnected for removal of the equipment, tank, or valve, and shall be of the type specified in the following:

- B. Copper Pipe: soldered joint, Nibco series 633 or 733, Mueller, or equal. MSS SP-123
- C. Dielectric: Watts, Jomar, or equal. ASSE 1079

## 2.05 REGISTERS, GRILLES AND DIFFUSERS

- A. Air terminals shall be Titus, Price, or approved equal, as scheduled on the Drawings.
- B. All terminals shall be steel and shall be factory painted. The finish shall be #26 white unless otherwise noted. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.
- C. The manufacturer shall provide published performance data for the diffusers and grilles. The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70-1991.
- D. Air terminals for installation in gypsum board shall have a 1" border for surface mounting. All air terminals for installation in lay-in ceilings shall have a lay-in frame to match the specified grid system.
  - 1. Ceiling Diffusers - high capacity (CD-1)
    - a. Ceiling diffusers shall be Titus model TDC (steel), fixed, horizontal discharge pattern. A square or rectangular inlet shall be an integral part of the frame assembly and a transition piece shall be available to facilitate attachment of round duct. An inner core assembly consisting of fixed deflection louvers shall be available in one-, two-, three- or four-way horizontal discharge patterns. The inner core assembly must be removable in the field without tools for easy installation, cleaning or damper adjustment.
    - b. Throw reducing vanes (TRV) shall be provided to deflect a horizontal discharge airstream from each side of the TDC diffuser into diverging airstreams.
  - 2. Ceiling Return Grilles, Exhaust Grilles (CR)
    - a. Return/exhaust grilles shall be Titus 50F with aluminum grid and aluminum border. Grilles must provide a free area of at least 90%. Outer borders shall be constructed of heavy extruded aluminum with a thickness of 0.040-0.050 inch and shall have countersunk screw holes. Border width shall be 1¼" on all sides and shall be interlocked at the four corners and mechanically staked to form a rigid frame.
    - b. Aluminum grid size: ½ x ½ x ½ inch

## 2.06 ACCESS PANELS

- A. Where construction is not inherently accessible, provide adequately sized and conveniently located access doors in ceilings, walls, and furring for access to controls and for servicing valves, equipment, etc.
- B. Access doors shall be flush, prime coated steel except for tiled surfaces, screwdriver operated cam locks, except for fire-rated, which shall be as indicated below. Minimum size shall be 12" x 12". Provide larger sizes where required.
  - 1. Fire Rated walls and ceilings: Milcor style UFR, Karp style KRP, or approved equal, U.L. Class B, 1½ hour rated, 20-gauge steel door; 16-gauge steel frame; insulated, self-closing, continuous piano hinge; keyed paddle latch, interior latch release.
  - 2. Drywall ceilings or walls: Milcor style DW, Karp style KDW or approved equal, drywall

bead; 16-gauge steel frame & door or 16-gauge steel frame & 14-gauge steel door; concealed spring hinge

3. Masonry walls: Milcor style M, Karp style DSC-214M, or approved equal, 16-gauge steel frame & door or 16-gauge steel frame & 14-gauge steel door; spring loaded hinge
4. Tiled walls and ceilings: Milcor style MS, Karp style DSC-214M(S), or approved equal, 16-gauge stainless steel frame & door or 16-gauge stainless steel frame & 14-gauge stainless steel door; satin finish; spring loaded hinge
5. Plastered walls and ceilings: Milcor style K, Karp style DSC-214PL, or approved equal, 16-gauge steel frame; 14-gauge steel door; casing bead; concealed spring hinge or continuous piano hinge

C. Doors shall be delivered to the General Contractor for installation.

## 2.07 VIBRATION ISOLATORS

- A. Unless otherwise noted on the equipment schedule, all mechanical equipment shall be mounted on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. All isolators shall be Mason Industries, Kinetics, or approved equal. Rated deflections and model numbers shall be as scheduled on the drawings.
- B. Spring equipment mounts, earthquake motioned restrained:
  1. Mounts shall incorporate a single spring vibration isolator built into a welded steel mount assembly, designed and engineered to limit movement of supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions.
  2. Mounts shall incorporate a welded steel plate and motion limit assembly, and steel spring isolator, engineered as a system to accept a force of 1.3 times the rated load capacity of the spring isolator without yield or failure, and shall limit movement of the point of level bolt connection to supported equipment to 0.75 inches in any direction, relative to any fixed point on the mount assembly, while subjected to the minimum force specified.
  3. The motion limit assembly shall be welded to a steel base plate having a ¼" thick ribbed neoprene noise stop pad, and drilled holes for bolting to supporting structures.
  4. Springs shall be wound steel, using high strength, heat treated spring alloy steel and shall have a horizontal spring stiffness equal to or greater than 1.3 times the rated vertical spring stiffness. The outside diameter of each spring shall be a minimum of 0.8 times the rated vertical spring height.
  5. Springs shall be selected to provide the tabulated minimum operating static deflections and shall provide a 50% overload capacity before reaching solid state. Springs shall be designed to reach solid state before exceeding the spring steel fatigue point.

## 2.08 DUCTWORK

- A. Sheet Metal Ductwork:
  1. Ducts and plenums shall be fabricated and installed in conformance with the latest editions of NFPA 90A; California Building Code; California Mechanical Code, and SMACNA HVAC Duct Construction Standards (Metal & Flexible). Ducts and plenums shall be constructed of G-60 coated galvanized steel of lockforming grade conforming to ASTM A653 and A924 Standards. Seals shall be airtight Class "B" seals at all transverse joints and longitudinal seams. Tables and figures hereinafter referenced are from the 4th edition of the SMACNA HVAC Duct Construction Standards (Metal and Flexible).
  2. Rectangular duct construction shall conform to Table 2-3. All transverse joints shall be flanged per Table 2-32, with corner closures or "Duct Mate" flanged connections with corner closures per Figure 2-17 or 2-18. Elbows shall be standard radius (Type RE 1) or square throat with vanes (Type RE 2) per Figure 4-2, with double thickness turning vanes



- per Figures 4-3 and 4-4. Offsets and transitions shall be per Figure 4-7. Supply, return, and exhaust branch connections shall be per Figure 4-5 or 4-6. Splitters SHALL NOT be used.
3. Round ducts shall be spiral, McGill Airflow or equal. All transverse joints and longitudinal seams shall have Class "B" seals. All branches in round duct systems shall be made with factory fabricated reducing wye branches. Duct turns shall be made with standard factory-fabricated three-piece elbows.
  4. Lined ducts shall be fabricated such that the net inside dimensions equal the duct sizes shown on the Drawings.
  5. Flexible ducts shall be acoustical type, Flexmaster "6M", Casco "Silent Flex - SF-18M", or approved equal. Flexible ducts shall be used only where shown on the Drawings, and maximum length of any given flexible duct shall not exceed 5 feet. Galvanized sheet metal elbows shall be used for turns greater than 45 degrees on flexible ducts 10 inches and larger. Connections to rectangular ducts shall be made with "spin-in" fittings with air scoops. The installation of flexible ducts shall conform to Figure 3-10, with the exceptions noted herein.
  6. Supports for horizontal ducts and plenums shall be fabricated per Figures 5-5 and 5-6 and Tables 5-1, 5-2, and 5-3. The maximum distance between hangers shall be 8 feet for rectangular ducts and 12 feet for round ducts. Attachments to the structure shall be made with adequately sized lag bolts for strap hangers and adequately sized machine bolts and side beam brackets for rod hangers. Supports for vertical ducts shall be band iron strap or angle bracket type per Figures 5-8 and 5-9.
  7. All roof-mounted ductwork shall be water-tight and sloped to shed water. All transverse joints shall be T-25 flanged Ductmate "25" or approved equal.
  8. Outside air intakes shall be type 316 stainless steel.
- B. Fiberglass Ductwork:
1. Fiberglass ductwork is unacceptable and may not be used on this project.
- C. Specialties:
1. Duct Mounted Access Doors
    - a. Including those for removing filters, duct access doors shall be fabricated as detailed in Figure 7-2, with sash locks, piano hinges, and cam latches. Round duct shall be fabricated as detailed in Figure 7-3.
    - b. Access doors shall be double wall, rectangular, insulated or uninsulated same as duct. Insulation fill and thickness shall be as indicated for pressure class.
    - c. Access doors shall have a vision panel and an unobstructed full swing.
    - d. Fabricate doors airtight and suitable for duct pressure class.
  2. Dampers:
    - a. Provide butterfly or multiple blade dampers where indicated on the Drawings or as required for balancing air quantities, to values shown without generating excessive noise. Provide Duro-Dyne "KS-385", or approved equal, locking quadrants on each manual damper. Locate dampers in furred ceilings near access panels where possible.
    - b. Butterfly dampers shall be constructed as per Figure 7-4, Figures A, B, and C.
    - c. Multi-blade dampers shall conform to Figure 7-5.
    - d. Backdraft dampers: Ruskin CBD6 or approved equal, heavy duty dampers with 12 gauge galvanized steel structural brace at each corner. Blades shall be of extruded aluminum with extruded vinyl blade edge seals mechanically locked into blade edge. Corrosion resistant bearings, long life synthetic type. Linkage shall be tiebar connected to stainless steel pivot pins.
  3. Remote Actuators: Young Regulator Company, Round Cable Controlled Dampers Model 5020-CC or 830A-CC (rectangular) and Remote Cable Control System Kit Model 270-301EZ. All dampers in inaccessible ceilings shall have remote actuators.
  4. Air Extractors: Duct mounted volume extractors made of galvanized steel with 1-inch blade

- spacing, Titus model "AG-45", or equal.
5. Flexible Duct Connections: Duro-Dyne "Metal-Fab" constructed of Durolon, or Ventfabrics "ventglas", or approved equal. Install at each point where a blower unit is connected to a duct. A minimum clearance of 3 inches between the duct and the source of vibration shall be maintained. Install per Figure 7-8.
  6. Screens: Install removable bird screens at ALL outside air intakes and exhaust air discharges. Screens shall be fabricated from ½" x 14 gauge mesh secured in full frames. Screens and frames shall be constructed of the same material as the duct, hood, or equipment to which attached.
  7. Access Panels: Milcor, Style M, prime coated steel, or approved equal. Minimum size shall be 10" x 10". Provide larger sizes where required. Locks shall be flush, screwdriver operated. Provide as required for concealed ducts at all fire dampers, electric duct heaters, and automatic dampers except at suspended acoustical ceilings.
  8. Duct Joint Sealants
    - a. Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723. Manufacturers: Hardcast, Tremco, Design Polymeric, Ductmate, or equal.
    - b. Water-Based Joint and Seam Sealant:
      - 1) Brush on application, water resistant, mold and mildew resistant, VOC: Maximum 75 g/L (less water), maximum static-pressure class: 10-inch wg, positive and negative, indoor or outdoor service, compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets. VOC: Maximum 75 g/L (less water).
    - c. Flanged Joint Sealant:
      - 1) Single component, acid-curing, silicone, elastomeric, Type S, Grade NS, Class 25. Use: O.
    - d. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  9. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
  10. Gasket Tape: Ductmate 440 or equal

## 2.09 INSULATION

- A. General
  1. All duct insulation materials including jackets, tapes, adhesives and coatings shall meet ASTM E84/UL 723 "25/50 Flame Spread/Smoke Development" requirements and NFPA 90A and 90B.
- B. Exterior of Ductwork: (Flexible Duct Wrap)
  1. Unless specified to be lined, all ductwork shall be externally insulated by wrapping with formaldehyde-free, flexible glass fiber blanket or inorganic glass mineral wool wrap, with factory applied FSK vapor barrier jacket. Thickness shall be 2 inches unless noted or required otherwise.
  2. Duct wrap shall meet the requirements of ASTM C1290, ASTM C553, and ASTM C1136. Corrosiveness shall meet ASTM C665. Mold growth/fungi resistance shall meet ASTM C1338.
    - a. Johns Manville "Microlite FSK", Knauf "Atmosphere Duct Wrap", or Certainteed "SoftTouch" or "Wide Wrap".
- C. Interior of Ductwork: (Duct Liner)
  1. All ducts exposed to the weather shall be internally insulated. All other ductwork within 10

feet of a fan (supply and return) shall be internally insulated. Duct liner shall be installed in supply and return ducts and plenums where noted on the Drawings. Exhaust ductwork need not be insulated.

2. Duct liner shall meet the requirements of ASTM C1071. Operating temperature shall meet ASTM C411. Microbial growth shall meet ASTM C1338, and ASTM G21 and G22.
  - a. Type I - Flexible Duct Liner: Johns Manville "Linacoustic RC", Knauf "Atmosphere Duct Liner", or Owens Corning "QuietR Rotary Duct Liner". Thickness shall be 1 ½ inches, unless otherwise noted.
  - b. Type II - Plenum Liner Board: Johns Manville "Linacoustic R-300", Owens Corning "QuietR Duct Liner Board", or Knauf Insulation "Atmosphere Rigid Plenum Liner". Thickness shall be 1 ½ inches, unless otherwise noted.

D. Refrigerant Piping:

1. Insulate all refrigerant liquid, vapor, and suction lines, fittings, and valves with flexible elastomeric thermal insulation, Armacell "AP ArmaFlex" black and white tube insulation, or equal. Formaldehyde free, microbial protection, conforms to Title 24 standards, and GREENGAURD®. Install according to manufacturer's suggested installation procedures.
2. Liquid, suction, and hot gas (where applicable) lines shall be insulated individually.
3. Oil equalization lines between multiple condensing units shall be insulated.
4. All piping exposed to the weather shall be finished with aluminum jacketing with a laminated moisture retarder. ITW Insulation Systems, RPR Products "Insul-Mate" or approved equal. Aluminum jacketing shall be overlapped 2 to 3 inches and held in place with stainless steel bands to form a weather tight system. Elbows and tees shall be fitted with matching aluminum fitting covers. Other fittings in metal-jacketed systems shall be finished with conventional weather-resistant insulating materials with painted

E. Piping insulation thickness shall be as follows:

FLUID TEMPERATURE RANGE (°F)	CONDUCTIVITY RANGE (in Btu-inch per hour per square foot per °F)	INSULATION MEAN RATING TEMPERATURE (°F)	NOMINAL PIPE DIAMETER (in inches)				
			1 and less	1 to <1.5	1.5 to <4	4 to <8	8 and larger
			INSULATION THICKNESS REQUIRED (in inches)				
Space Cooling Systems (chilled water, refrigerant and brine)							
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0
Below 40	0.20-0.26	50	1.0	1.5	1.5	1.5	1.5

F. All tanks, expansion tank, pumps, volutes, valves and strainers shall be completely insulated with ½" Armaflex glued and sealed, vapor tight, in place with Armstrong #520 adhesive.

G. Fire Rated Duct Wrap Insulation

1. 3M Fire Barrier Duct Wrap 615+: Lightweight, non-asbestos, high temperature, bio-soluble, calcium-magnesium-silicate (CMS) non-woven blanket, encapsulated in a scrim-reinforced foil, blanket thickness of 1.5 inches (38 mm) for ventilation and grease duct applications.

**2.10 EXHAUST VENTILATION FANS**

- A. Panasonic "Whisper Green Select" series, model FV-1115VK2 ventilation fan as scheduled on the Drawings or approved equal. The fan shall be ceiling mounted and shall have a built-in speed selector. The ventilation rates shall be adjustable at 110-130-150 cfm./
- B. The fan housing shall be 2 gauge with Zinc-Aluminum-Magnesium (ZAM) coating. An integrated 6" diameter duct adapter shall be included. An installation bracket expandable to 24" shall be included.

- C. The fan shall include a built-in damper and built-in metal flange to provide blocking for penetrations through drywall.
- D. The motor shall be enclosed with brushless ECM motor that is rated for continuous operation. The ECM motor speed shall automatically increase when the fan senses static pressure to maintain select cfm. The motor shall be permanently lubricated plug-in type and shall be equipped with a thermal cutoff fuse.
- E. The grille shall be of "Poly Pro" material and shall attach directly to housing with torsion springs.
- F. Provide with Plug and Play Modules "Multi-Speed with Time Delay" and "Smart Action Motion Sensor".
  - 1. Multi-Speed with Time Delay
    - a. Allows selection of the proper CFM settings to satisfy ASHRAE 62.2 continuous ventilation requirements. The fan runs continuously at a pre-set lower level (0, 50-120 CFM, in 10 CFM increments), then elevates to a maximum level of operation (110-130-150 CFM) when the wall switch is turned on, or when the motion sensor is activated. A High/Low delay timer returns the fan to the pre-set CFM level after a period of time set by the user.
  - 2. Motion Sensor
    - a. Motion sensor automatically activates when someone enters the room. Once the settings have been applied, the fan becomes automatic. This module also activates a 20-minute delay off timer for the fan.

## 2.11 CEILING MOUNTED SUPPLY FANS

- A. Panasonic "Whisper Fresh Select" series, model FV-15NLFS1, fresh air supply fan as scheduled on the Drawings or approved equal. The fan shall be low noise remote mount type, rated for continuous run, and shall include an integrated 5.8 foot power cord..
- B. Motor/Blower
  - 1. The motor shall be ECM type, with "Smartflow" technology, and shall be equipped with thermal cut-off fuse.
  - 2. The fresh air supply rates shall be manually adjustable for 50-62-70-80-90-100-110-130-150 cfm.
  - 3. Four-pole totally enclosed condenser motor rated for continuous run.
  - 4. MERV 13 filter, included, shall be replaced with a MERV 14 filter
- C. Housing
  - 1. The wall sleeve shall be of galvanized steel with fully insulated exterior and shall have an integrated 6" duct collar. A gravity damper shall be included on the supply air side of the unit.
- D. Controls
  - 1. Controls shall be built-in. Customized fresh air shall be supplied based on humidity conditions of incoming air. Fan shall automatically shut off (or not turn on) when the outside relative humidity is higher than the setting on the humidity dial (adjustable from 30% to 80% RH).
  - 2. Customized low temperature setting will shut fan off when incoming supply air is too cold. Fan will turn off (or not turn on) when the outside temperature is lower than the setting value. (from 15°F to 40°F) Fan shall automatically shut off intake air from entering the space when higher than 95°F.
  - 3. The access panel shall have a light indicator and an alarm signal to provide notification to check and clean the filter. A reset button will reset each time the filter is changed.

- E. The fans shall be two-way directional, with (3) included brackets for joist, truss, or suspension installations.

## 2.12 OUTDOOR HEAT RECOVERY CONDENSING UNIT

- A. Samsung, DVM S2 series, heat recovery condensing unit model AM240BXVGFR/AA as scheduled on the Drawings or approved equal.
- B. The heat recovery outdoor unit shall be used specifically with SAMSUNG DVM S2 heat recovery components. The heat recovery system shall consist of the AM240BXVGFR outdoor unit, MCU (Mode Control Units MCU-S4NEK3N, MCU-SN8EK1UN), indoor units (AM018TNZDCH/AA, AM036TNZDCH/AA, AM048TNZDCH/AA or AM007NNNDCH/AA and AM009NNNDCH/AA models) and SAMSUNG DVM S NASA Control Network Solution (Control systems). The outdoor units shall be equipped with multiple circuit boards that interface to the SAMSUNG DVM S mode control unit (MCU-S4NEK3N) and shall perform all functions necessary for operation. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit shall be run tested at the factory.
- C. Quality Assurance
  1. The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.
  2. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
  3. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
  4. A full charge of R-410A for the condensing unit only shall be provided in the condensing unit. Additional refrigerant is required based on diameters and lengths of system liquid refrigerant lines and indoor equipment model and quantity.
  5. The Contractor must have attended Samsung DVM S installation training prior to installing the system.
  6. Service and installation manuals must be readily available on the manufacturer's website without entering a username and password.
- D. Outdoor Unit
  1. The heat recovery system shall have the ability of simultaneous heating and cooling operation modes on all indoor units.
  2. The heat recovery condensing unit salt spray test method: ASTM B117-18 - the heat exchanger showed no unusual rust or corrosion development to 3,000 hours.
  3. The outdoor unit shall have advanced oil recovery cycle logic operation that shall not interrupt heating or cooling operation. The oil recovery cycle duration shall not exceed three (3) minutes while in cooling mode or six (6) minutes while in heating mode. While in heat mode, any defrost cycle lasting over three (3) minutes shall be considered an oil recovery cycle.
  4. Advanced intelligent defrost logic to significantly reduce defrost cycle frequency by monitoring air resistance across the condenser coil during heating operation to determine defrost operation initiation to prevent unnecessary defrost cycles.
  5. The heat recovery outdoor unit shall have a high pressure sensor, low pressure sensor, over-current protection, current transformer, fan motor voltage protection, fan motor thermal protection, current transformer, overheat protection, phase detection protection, and high voltage fuses.
  6. The heat recovery outdoor unit shall have a removable EEPROM at the main PCB to store all unit data. All data on the outdoor unit EEPROM shall be viewable from the manufacturer provided service software. The outdoor unit main EEPROM shall be removable allowing replacement of outdoor unit PCB without losing digital, field programmed data. The outdoor unit removable EEPROM shall store the following unit

data: unit model number, unit serial number, unit main PCB firmware and MICOM version, sub-PCB firmware and MICOM version, fan PCB firmware and MICOM version, inverter PCB 1 and inverter PCB 2 firmware and MICOM version, auto-trial commissioning startup data, the last 30 minutes of operation data, and field programmed unit name/tag viewable on controls and service software.

7. Outdoor unit shall have a sound rating no higher than 66 dB (A).
  8. The heat recovery outdoor unit shall be capable of operating in heat mode between -22°F ~ 75°F ambient temperatures.
  9. The outdoor unit shall be capable of operating in cooling mode between 5°F ~ 122°F ambient temperatures.
  10. The heat recovery system compressors shall be SAMSUNG, hermetically sealed, inverter driven, flash injected, DC scroll type, with soft start capability. No fixed capacity compressors will be present in the refrigerant system.
- E. Unit Cabinet:
1. The chassis shall be fabricated of galvanized steel, bonderized and finished with a powder coated baked enamel.
- F. Fan:
1. All fan motors shall be variable speed BLDC type.
  2. All fan motors shall have inherent protection, thermal protection, permanently lubricated bearings, and be completely variable speed.
  3. All fan motors shall be mounted for quiet operation.
  4. All fans shall be provided with a raised guard to prevent contact with moving parts.
- G. Refrigerant System
1. R410A refrigerant shall be required for the heat recovery outdoor systems. Additional refrigerant is required.
  2. Mode Control Units (MCU) are required for proper operation. Indoor units that will only operate in cooling mode year-round (cooling-only) may be piped directly to the liquid and suction pipes bypassing MCU connection.
  3. The compressors shall be hermetically sealed, inverter driven, direct flash injected, DC scroll type with soft-start capability manufactured by Samsung. The compressor(s) shall feature an asymmetrical scroll design with rotating compressor operation/priority (where applicable). Flash injected compressors provide advanced low ambient heating performance.
  4. The system shall have subcooling devices to maintain capacity at extreme system refrigerant pipe lengths and to minimize refrigerant noise.
  5. The system shall allow a reduction of the main liquid refrigerant pipe (outdoor unit to first unit or Y joint) by one diameter reducing total system refrigerant volume and pipe and insulation costs if line lengths and vertical separation are within the reduced pipe diameter guidelines.
- H. Heat Exchanger
1. The heat exchanger shall be mechanically bonded fin to copper tube. The aluminum fins of the heat exchanger shall have a protective coating.
  2. Salt spray test method: ASTM-B117-18 - The heat exchanger showed no unusual rust or corrosion development to 3,000 hours.
  3. The heat exchanger shall consist of two separate circuits to enhance the heat pump defrost cycle. The unit shall use the entire coil initially for the defrost cycle. To resume heating faster in extreme conditions, the upper section shall return to heating operation while the lower section continues to defrost.
- I. Active Artificial Intelligence

1. The outdoor unit shall feature Active Artificial Intelligence (AI) shall monitor environmental and system operational data and use Deep Neural Network algorithms to provide optimal system performance and reliability.
2. Active Artificial Intelligence (AI) shall be used to optimize high pressure control, low pressure control, defrost cycle activation and operation, and low refrigerant detection.
3. The outdoor unit shall use Active Artificial Intelligence (AI) to monitor system refrigerant volume in real-time while in cooling mode to detect possible leaks or low refrigerant charge and provide an error code before system shutdown (conditions apply)

J. Controls

1. The outdoor unit shall have a removable EEPROM that stores unit serial number, startup information, system settings, system tag/name, and other information.
2. Control wiring shall be 16 AWG X 2 shielded wire.

K. Other Features

1. Inverter PCB cooling shall be done with liquid refrigerant and air to maintain optimal and safe operating temperatures.
2. The system shall feature advanced oil recovery cycle logic (maximum duration in cool mode: 3 minutes, maximum duration in heat mode: 6 minutes, defrost cycles lasting over 3 minutes are considered oil recovery cycles). Oil recovery operation shall not interrupt heating or cooling operation.
3. The outdoor unit shall feature advanced intelligent defrost logic to significantly reduce defrost cycle frequency by monitoring air resistance across the condenser coil during heating operation to determine defrost operation initiation to prevent unnecessary defrost cycles.
4. The outdoor unit shall feature maximum current control settings to limit current (50% - 100% of design current) adjustable at outdoor unit, supported central controls, and supported indoor unit wired controllers.
5. The outdoor unit shall feature energy savings options to reduce system energy consumption when average indoor room temperatures are greater than average indoor set temperatures in heating mode or when average indoor room temperatures are lower than average indoor set temperatures in cooling mode.

## 2.13 MCU (MODE CONTROL UNIT) FOR HEAT RECOVERY SYSTEMS

- A. Samsung DVM S series MCU (Mode Control Units), models MCU-S4NEI3N and MCU-S8NEK1UN, as scheduled on the Drawings. The units shall be compatible with Samsung DVM S2 heat recovery systems.

1. Allows for simultaneous heating and cooling on a single system.
2. Serial connection capability to supply refrigerant to other MCU's thus reducing Y-joint installation quantity (see example below).
3. The MCU shall have pressure equalization valves (480 steps) to reduce refrigerant sounds during mode changing of connected indoor units.
4. Using solenoid valves, the MCU shall control the path of refrigerant to the indoor unit(s) based on the mode of operation required.
5. The unit shall contain internal subcoolers with an electronic expansion valve to maximize performance of connected units and reduce refrigerant sounds
6. The MCU must be mounted indoors, level, with the pipes running horizontally in and out of unit.
7. No drain connection required.
8. The MCU (Mode Control Unit) shall be completely factory assembled, piped, and wired. Each unit shall be run tested at the factory.

B. Construction

1. Galvanized steel cabinet
2. Most internal devices can be serviced via bottom panel. The PCB and wiring is accessible from the back.

C. The table below identifies MCU models and indoor unit connection data.

<u>MCU Model Number</u>	<u>Connectable Indoor Unit Qty.</u>	<u>Port Qty.</u>	<u>Sum of Indoor Unit Capacity (maximum)</u>
MCU-S4NEK3N	1 - 32	4	Up to 216,000 Btu/h
MCU-S8NEK1UN	1 - 64	8	Up to 290,000 Btu/h

- D. MCU-S4NEK3N shall have 4 ports with a maximum connected quantity of 32 indoor units (maximum 8 indoor units per port). The sum of indoor unit's capacity shall not exceed 54MBH (54,000 btu/h) per port, and 216 MBH (216,000 btu/h) total. Two (2) adjacent ports shall be twinned using Y-Joint part number MXJ-YA1509M (purchased separately) when connecting indoor unit(s) greater than 54 MBH (54,000 btu/h), but less than 108 MBH (108,000 btu/h). The MCU-S4NEK3N shall not connect under-ceiling indoor units without the installation of single zone EEV kits (MEV-A\*\*SA). MCU-S4NEK3N shall allow series connection of additional MCU's reducing Y-joint installation to a maximum capacity of (216 MBH) 216,000 btu/h.
- E. MCU-S8NEK1UN shall have 8 ports with a maximum connected quantity of 64 indoor units (maximum 8 indoor units per port). The sum of indoor unit's capacity shall not exceed 54MBH (54,000 btu/h) per port, and 216 MBH (290,000 btu/h) total. 2 adjacent ports shall be twinned using Y-Joint part number MXJ-YA1509M (purchased separately) when connecting indoor unit(s) greater than 54 MBH (54,000 btu/h), but less than 108 MBH (108,000 btu/h). The MCU-S8NEK1UN shall not connect under-ceiling indoor units without the installation of single zone EEV kits (MEV-A\*\*SA). MCU-S8NEK1UN shall allow series connection of additional MCU's reducing Y-joint installation to a maximum capacity of (290 MBH) 290,000 btu/h.
- F. Controls
1. The unit shall be operated via a DDC type signal. Control wiring shall be 16 AWG x 2 shielded wire.
- G. MCU (Mode Control Unit) Cabinet:
1. The chassis shall be fabricated of galvanized steel.
  2. Each cabinet shall house multiple refrigeration control solenoid valves and electronic expansion valves.
  3. MCU-S4NEK3N shall house 4 tube-in-tube subcooling devices with an electronic expansion valve and temperature sensors to maintain design refrigerant temperatures (sub cooling). All pipe connections shall be braze type.
  4. MCU-S8NEK1UN shall house 8 tube-in-tube subcooling devices with 2 electronic expansion valve and temperature sensors to maintain design refrigerant temperatures (sub cooling). All pipe connections shall be braze type.
- H. Refrigerant:
1. R410A refrigerant shall be required for MCU's (Mode Control Units).

**2.14 MINI 4-WAY CEILING CASSETTE WITH GRILLE INDOOR UNIT (AM0\*\*)**

- A. Provide Samsung indoor unit models AM007NNNDCH/AA and AM009NNNDCH/AA, as scheduled on the Drawings. The unit shall be a mini 4-way cassette style indoor unit that recesses into the ceiling with a ceiling grille (ordered separately). The indoor unit shall be factory assembled, wired, and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating expansion device, control circuit board and fan motor.
1. The units shall be compatible with Samsung DVM S systems.



2. Electro-static, washable, pleated filters as standard (included with fascia panel)
3. Built in condensate pump with maximum 29" lift from the bottom of the unit, check valve, and float switch that disables indoor unit during overflow detection
4. Knock-out for outside air capability
5. Fascia panel shall have LED indicator lights and 4 motorized louvers with independent control (32° - 65° louver control range)
6. High-voltage terminal block temperature sensor to disable unit in the event overheating of power connection.
7. WindFree™ function will close the supply air outlet louver while in cooling mode to gently disperse cool air into the space without blowing directly onto occupants. The WindFree™ feature is optional and can be enabled using central or local control options.
8. The WindFree™ Mini 4-way cassette can be configured for 2-stage operation, cooling the space with the louver open (fixed or swing) until the room temperature nears set temperature. Once room temperature is near set temperature, WindFree™ operation will start automatically, closing the louver and using the face of the fascia panel to gently cool the space with still air\*.
9. The WindFree™ panel (PC4SUFMUN) has an integral humidity sensor that will open the louvers for standard cool mode when space conditions could potentially cause condensation formation on the panel surface.

B. Construction

1. Insulated, HIPS chassis with a galvanized steel frame and fascia panel certified to UL94 V0.

C. Heat Exchanger

1. The heat exchanger shall be mechanically bonded fin to copper tube

D. Indoor Fan

1. Indoor fan is a single turbo type
2. Three fan speed settings and auto setting

E. Controls

1. The unit shall be operated via a wireless or wired remote control with DDC type signal
2. Control wiring shall be 2 X 16 AWG shielded wire

F. Fan:

1. The indoor fan assembly shall be a turbo fan, BLDC type.

**2.15 MULTI-POSITION, DUCTED, INDOOR UNIT (AM0\*\*TNZDCH/AA)**

- A. Provide Samsung multi-position indoor unit model AM018TNZDCH/AAM, model AM036TNZDCH/AAM, and model AM048TNZDCH/AAM as scheduled on the Drawings. The multi-position ducted indoor unit shall be compatible with DVM S HR (Heat Recovery) outdoor units and MCU (Mode Control Unit).
- B. The indoor unit shall be factory assembled, wired, and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air (Nitrogen gas) before shipment from the factory.
- C. The indoor unit shall have the ability to install optional, supplemental, electric heat kits provided by the manufacturer.
- D. The indoor unit shall have an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.
- E. Construction

- 1. The unit shall be constructed of insulated, powder coated, galvanized steel
- F. Heat Exchanger
  - 1. The heat exchanger shall be mechanically bonded fin to copper tube
- G. Indoor Fan
  - 1. Indoor fan is a double-inlet, forward curve, centrifugal type with a single constant-torque (ECM) fan motor.
  - 2. The indoor unit shall have low, medium, high, and auto fan speed setting options.
  - 3. Five fan speed taps for optional air flow setting during installation.
  - 4. The indoor unit shall have the capability to turn the fan off in heating or cooling modes while in thermal-OFF status (external sensor required).
- H. Controls
  - 1. 0 volt ON/OFF control (ex: auxiliary drain switch) when using the optional CN83 pigtail (part number DB39-01263A, sold separately).
  - 2. Controls shall integrate with a BMS system
  - 3. Control wiring shall be 2 X 16 AWG shielded wire
- I. Air Filtration
  - 1. Air filtration must be field provided.

**2.16 SUPPLEMENTAL ELECTRIC HEAT KITS FOR MULTI-POSITION AIR HANDLERS (VHK-\*\*\*A)**

- A. Provide Samsung supplemental electric heat kits for the multi-position air handlers to provide supplemental heat when the compressor cannot provide enough capacity due to low ambient conditions or for primary heat with cooling-only systems.
- B. Provider the supplemental electric heat kits as noted in the table below.

<i><u>Indoor Unit Model Number</u></i>	<i><u>Compatible Heat Kit</u></i>	<i><u>kW</u></i>
AM018TNZDCH/ AA	VHK-103A	3
AM036TNZDCH/ AA	VHK-210A	10
AM048TNZDCH/ AA	VHK-305A OR VHK310A	5 or 10

- C. The heat kit installs inside the air handling unit and shall include breakers for overcurrent protection and to turn off the air handler.
- D. The electric heat kit control wiring shall plug directly into the electric heat kit control plug inside the air handling unit.
- E. The electric heat kit shall contain limit switches to prevent overheating.
- F. The supplemental electric heat kit shall include an external temperature sensor that must be connected to the suction pipe during installation. This sensor will not allow the heat kit to activate when the supplied refrigerant temperature is above 109°F to prevent unnecessary use.
- G. When installed in DVM S multi-position air handlers, the indoor unit can be programmed to activate the supplemental electric heat kits based on set temperature and room temperature difference along with a time delay of up to 20 minutes (see indoor unit installation manual for more details).
- H. The supplemental electric heat kit shall include all components necessary for heat kit installation.

## 2.17 SPLIT SYSTEM

- A. Provide Samsung "Max Heat 2.0" series, models AR12TSFABWKNCV and AR12TSFACWKXCV, wall mounted evaporator split system, as scheduled on the Drawings.
- B. The variable capacity, heat pump air conditioning system shall be (cool/heat) split system heat pump. The heat pump system shall provide high heating capacity down to -13°F outside temperature. The heat pump system shall consist of a single outdoor condensing unit, single indoor unit, and wireless controller. The condensing unit shall be a horizontal discharge, 208/230V, 1Ph, 60Hz unit. The evaporator shall be wall-mounted (high-wall) type.
- C. Quality Assurance
  - 1. The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.
  - 2. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
  - 3. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
  - 4. A full charge of R-410A for the condensing unit only shall be provided in the condensing unit. Additional refrigerant is required based on lengths of system liquid refrigerant lines.
- D. The Samsung Max Heat system shall provide 100% heating capacity at 5°F outdoor temperature and high heating capacity at -13°F outdoor temperature.
- E. The outdoor unit shall have a base pan heater as standard to ensure optimal defrost cycle water drainage.
- F. The indoor unit shall feature "Wind-Free™" mode\*. In cooling mode, as room temperature nears set temperature, the unit will close its louver and will disperse air into the space through thousands of micro-holes on the front of the indoor unit preventing cold air drafts on occupants.
- G. The indoor unit shall have Wi-Fi capability as standard
- H. Outdoor unit shall provide 208/230V power to indoor unit via 14 AWG X 3 interconnect power cable
- I. Construction
  - 1. Indoor unit chassis shall be UL94 V0 with a galvanized steel mounting bracket
  - 2. The indoor unit shall have easy-access to wire, pipe, and drain connections via access panel on the bottom of the unit for simple installation and service.
  - 3. The outdoor unit shall be galvanized steel with a baked on powder coated finish for durability.
- J. Heat Exchanger
  - 1. The heat exchangers shall be mechanically bonded fin to copper tube
- K. Refrigerant System
  - 1. The compressor shall be hermetically sealed, inverter controlled, BLDC Rotary
  - 2. Refrigerant flow shall be controlled by an electronic expansion valve at the outdoor unit
- L. Indoor Fan
  - 1. The indoor fan shall be a single, antibacterial cross-flow type
  - 2. Three fan speed settings and auto setting
  - 3. Automatic (motorized) vertical swing (up/down) and horizontal swing (left/right) louvers
- M. Controls
  - 1. The system shall have a built in Wi-Fi adapter as standard to allow control and monitoring using the Samsung SmartThings app (Android, iOS)

2. Dual set temperature support when connected to MWR-WG00UN
- N. Advanced Wired Controller.
1. The indoor unit shall have a simple connection for overflow detection devices or any other normally closed contact for simple unit shutdown
  2. The indoor unit shall ship with a wireless controller, holder, and batteries
- O. System energy consumption can be viewed using the Samsung SmartThings mobile app or on the indoor unit display using the included wireless controller\*\* AI (artificial intelligence) Auto Mode technology monitors factors such as indoor temperature, outdoor temperature, set temperature, and operating time to learn the patterns within your home to automatically adjust system operation to maximize occupant comfort and efficiency (Wi-Fi connection required)
- P. OUTDOOR UNIT
1. The outdoor unit shall be equipped with multiple circuit boards that shall perform all functions necessary for operation. The outdoor unit shall have a powder coated finish. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory.
  2. The outdoor unit shall have a sound rating no higher than 46 dB.
  3. Both refrigerant lines from the outdoor unit to indoor units shall be insulated.
  4. The outdoor unit shall have an accumulator.
  5. The outdoor unit shall have a high-pressure safety switch, fuse, over-current protection and crank case heating capability.
    - a. The outdoor unit shall have the ability to operate with a maximum height difference and total length of 49 feet maximum vertical separation and maximum line set length of 66 feet.
    - b. The outdoor unit shall be capable of operating in outside ambient temperatures between 0°F to 115°F in cooling mode without additional low ambient controls or devices.
    - c. The outdoor unit shall have a base pan heater as standard to ensure optimal defrost cycle water drainage.
  6. Unit Cabinet:
    - a. The chassis shall be fabricated of galvanized steel, bonderized and finished with a powder coated baked enamel.
  7. Fan:
    - a. The outdoor unit shall be furnished with one direct drive, variable speed propeller type fan.
    - b. All fan motors shall be BLDC type.
    - c. The fan motor shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.
    - d. The fan motor shall be mounted for quiet operation.
    - e. The fan shall be provided with a raised guard to prevent contact with moving parts.
    - f. The outdoor unit shall have horizontal discharge airflow.
  8. Refrigerant
    - a. The condensing unit shall require R410A refrigerant.
    - b. The condensing unit shall come charged for system line set lengths up to 25 feet. Additional refrigerant is required if the system line set length is over 25 feet.
    - c. The condensing unit shall contain a single EEV (electronic expansion valve) with 480 positions each to control refrigerant flow to the indoor unit.
  9. Coil:
    - a. The outdoor condenser coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.

- b. Aluminum coil fins shall be coated with a hydrophilic/protective coating to promote moisture shedding.
  - c. The coil shall be protected with an integral guard.
  - d. Refrigerant flow from the outdoor unit shall be controlled by means of a capacity modulation capable, inverter driven, twin BLDC rotary compressor.
10. Compressor:
- a. The compressor shall be an inverter driven, DC voltage, BLDC rotary compressor made by Samsung.

Q. INDOOR UNIT

1. Samsung AR12TSFABWKNCV (RNS\*\*ABT) wall-mounted indoor unit section with a slim silhouette and feature Wind-Free™ operation.
2. The indoor unit shall be factory assembled, wired, and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board and fan motor.
3. The indoor unit shall have an integral Wi-Fi adapter to allow remote control and monitoring using a mobile device.
4. The indoor unit shall feature Wind-Free™ operation. Wind-Free™ mode will close the air outlet louver and disperse air into the space through thousands of micro-holes on the front of chassis and the air outlet louver keeping the space cool without cold drafts. The Wind-Free™ unit delivers an air current that is under 0.15 m/s while in Wind-Free™ mode. Air velocity that is below 0.15 m/s is considered “still air” as defined by ASHRAE 55-2013 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).
5. Wind-Free™ mode only operates in Cooling and Dry modes.
6. The indoor unit shall automatically enter Wind-Free™ mode, as the room temperature approaches set temperature, when 2-Step cooling function is set.
7. An electronic modulating linear expansion valve is located inside the condensing unit for refrigerant control.
8. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function.
9. Indoor unit and refrigerant pipes shall be charged with dehydrated nitrogen gas before shipment from the factory.
10. The indoor unit shall have a nighttime sleep mode (Good Sleep mode) to reduce system noise and provide optimal sleep conditions enabled with the wireless controller.
11. The indoor unit shall have a single event, ON/OFF timer setting enabled at the wireless controller that allows configuration of a specific ON and OFF time. For ON events, a set temperature can also be specified.
12. The indoor unit high voltage terminals shall have a thermal fuse to prevent overheating due to loose connections of damaged components.
13. Unit Cabinet:
  - a. The casing shall be UL94 V0 with a white finish.
  - b. Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and four (4) directions for draining shall be standard.
  - c. Drain hose shall be on the right-hand side of the drain pan (when facing the front) as standard with optional left-hand side connection.
  - d. There shall be a separate galvanized steel mounting plate which secures the unit firmly to the wall.
  - e. Two digit, 7-segment display on front of unit shall provide unit operation, temperature, Wi-Fi status error status, and other notifications. The wireless remote controller shall provide an option to turn the display ON/OFF.
  - f. The indoor unit shall have easy-access pipe and drain connections via access panel on front of unit for easier installation and service allowing maintenance without pulling the unit out from the wall thus preventing property damage.

14. Fan:
  - a. The fan assembly shall be an anti-bacterial cross-flow type fan direct driven by a single motor.
  - b. The fan shall have three fan speed settings and auto setting.
  - c. The fan shall have automatic (motorized) vertical swing (up/down) and horizontal swing (left/right)
15. Filter:
  - a. Return air shall be filtered by means of an easily removable, electro-static, washable filter.
  - b. The indoor unit air filter shall be on top of the unit and accessible without opening a panel or door providing simple access for the end-user.
  - c.
16. Coil:
  - a. The indoor coil shall be of nonferrous construction with Slit fins on copper tubing.
  - b. The tubing shall have inner grooves for high efficiency heat exchange.
  - c. Aluminum coil fins shall be coated with a hydrophilic/protective coating to promote moisture shedding.
  - d. All tube joints shall be brazed with phos-copper or silver alloy.
  - e. The coils shall be pressure tested at the factory.
  - f. A condensate pan and drain shall be provided under the coil.
  - g. Both refrigerant lines to the indoor unit shall be insulated.
17. Controls
  - a. The system shall have a built in Wi-Fi adapter as standard to allow control and monitoring using the Samsung SmartThings app (Android, iOS)
18. Advanced Wired Controller.
  - a. The indoor unit shall have a simple connection for overflow detection devices or any other normally closed contact for simple unit shutdown
  - b. The indoor unit shall ship with a wireless controller, holder, and batteries
19. AI (artificial intelligence) Auto Mode technology monitors factors such as indoor temperature, outdoor temperature, set temperature, and operating time to learn the patterns within your home to automatically adjust system operation to maximize occupant comfort and efficiency (Wi-Fi connection required).
20. Eco Mode to reduce energy consumption during low demand operation
21. Smart install mode - startup system diagnostics operation to ensure system readiness during initial operation
22. Auto restart
23. Auto Clean Function
24. 7-segment digital display on front of unit to display temperature and unit status
25. "Fast" mode to quickly reach set temperature
26. Auto changeover
27. Good sleep mode
28. Quiet mode
29. Dry mode
30. Simple ON/OFF time function - Using the wireless controller specify the ON and/or OFF times
31. Electro-static, washable, main filter as standard accessible from the top of unit
32. Filter cleaning reminder
33. Interconnect control wire between outdoor and indoor unit shall be 16AWG X 2

### **PART 3 EXECUTION**

#### **3.01 GENERAL INSTALLATION**

- A. Provide all necessary cutting in connection with the work of this Section. No structural members shall be drilled, bored, or notched in a manner which will impair their structural capacity. All penetrations of concrete or masonry shall be made with core drills. No cutting shall be done without the approval of the Architect.

#### **3.02 HEATING & AIR CONDITIONING EQUIPMENT INSTALLATION**

- A. All units shall be set with curbs plumb, level, and securely attached through framed opening with bolts and/or lag screws as noted on the Drawings. Connections to ductwork shall be secured, filter racks shall be aligned, enclosures and ductwork connections shall be fully waterproofed, and all utility and control connections shall be complete.
- B. Rig and install in full accordance with manufacturer's requirements, project drawings, and contract documents. Refer to the manufacturer's installation manual for full requirements.
- C. Locate indoor and outdoor units as indicated on Drawings. Provide service clearance per manufacturer's installation manual. Adjust and level outdoor units on support structure.
- D. Components / Piping:
  - 1. Installing contractor shall provide and install all accessories and piping for a fully operational system. Refer to manufacturer's installation manual for full instructions.
  - 2. Traps, filter driers, and sight glasses are NOT to be installed on the refrigerant piping or condensate lines.
  - 3. Standard ACR fittings rated for use with R410A are to be used for all connections. Proprietary manufacturer-specific appurtenances are not allowed.
- E. Insulation:
  - 1. Refrigerant lines, as well as any valves, shall be insulated end to end with ½" closed-cell pipe insulation. If state or local codes require insulation other than that specified above, the greater insulation shall be used.
- F. Electrical:
  - 1. Installing contractor shall coordinate electrical requirements and connections for all power feeds with electrical contractor. Refer to Division 26 for additional information.
- G. Third Party Controls:
  - 1. Installing contractor shall coordinate all BAS/BMS control requirements and connections with Controls Contractor.

#### **3.03 INSULATION**

- A. Insulation shall be applied on clean, dry surfaces and only after tests and approvals required by the specifications have been completed.
- B. Insulation on all cold surfaces must be applied with a continuous, unbroken vapor seal. Hangers, supports, anchors, etc., that are secured directly to cold surfaces shall be adequately insulated and vapor sealed to prevent condensation.
- C. Adhesives, mastics, and coatings shall be applied at the manufacturer's recommended minimum coverage per gallon.
- D. Edges of vapor barrier insulation at valve stems, instrument wells, unions, and other raw edges shall be sealed adequately to prevent moisture from penetrating the insulation.
- E. Insulation Jacketing

1. Provide aluminum jacketing for all piping located aboveground, outdoors. Jacketing shall be secured to prevent removal without the use of tools.

F. Ductwork - General

1. In general, duct system shall be insulated with fiberglass blanket. Insulation on all cold surfaces shall be provided with a vapor barrier jacket.

G. Exterior Ductwork:

1. Duct wrap shall be cut in a manner to meet the manufacturers' stretch-out guideline to provide a 2" staple lap and have minimum compression at the corners. All joints shall be lapped 2" and stapled with outward clinching staples 2" on center. The insulation shall be mechanically fastened to the underside of all ducts 24" wide or more using cup-head pins, weld pins, or stick pins with speed clips 18" on center. Insulation shall not be compressed to comply with required installed R-value. All joints and penetrations of the vapor barrier jacket shall be sealed with a minimum 3" wide matching pressure sensitive tape. Pressure-sensitive tape shall be firmly rubbed in place immediately after application using a "squeegee" type tool.
2. When a vapor seal is required, two coats of vapor retarder mastic reinforced with one layer of 4" wide, open weave glass fabric may be used in lieu of pressure-sensitive tape. Mastic shall be brushed onto joint and glass fabric imbedded in it. A second coat of mastic shall be brushed over the glass fabric until the fabric is filled. Mastics shall be applied in accordance with application instructions on the container.

H. Interior Duct Liner

1. Apply to the inside face of ducts, coated side facing air stream. Fasten using fire retardant adhesive and secure with mechanical fasteners at 12" maximum o.c., both directions, for velocities up to 2,500 fpm. Velocities over 2,500 fpm shall have fastener spacing of 6" o.c.
2. Exposed edges must be factory or field coated with adhesive. Metal nosing shall be installed in all liner leading edges facing the airstream at fan discharge, at access doors, and at any interval of lined duct preceded by unlined duct.
3. Insulation with torn or broken coatings shall be removed and replaced. Loose corners, edges, and butt joints will not be accepted.

I. Refrigerant Piping:

1. The insulation shall be installed in accordance with the manufacturer's instructions. All joints and seams shall be sealed with waterproof vapor retarder adhesive. All piping exposed to the weather shall be finished with aluminum jacketing with a laminated moisture retarder. Aluminum jacketing shall be overlapped 2 to 3 inches and held in place with stainless steel bands to form a weather tight system. Elbows and tees shall be fitted with matching aluminum fitting covers. Other fittings in metal-jacketed systems shall be finished with conventional weather-resistant insulating materials with painted aluminum finish.

- J. All pipe insulation ends shall be tapered and sealed, regardless of service.

### 3.04 DUCTWORK

- A. Install ducts according to SMACNAs HVAC Duct Construction Standard, Metal and Flexible, unless otherwise indicated.
- B. All ductwork shall be installed within spaces provided, where possible. Ducts shall be installed true to line and grade, fully secured to structural framing with specified hangers and supports, insulated, and vibration isolated.
- C. Install duct systems as indicated unless deviations to layout are approved on shop drawings.



- D. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of the building.
- E. Install ducts with fewest possible joints.
- F. Each section of supply air ductwork shall be cleaned, dust and oil free, at the shop using a degreasing agent and detergent and sealed airtight at both ends with visqueen and tape. Supply ducts shall be additionally cleaned with a disinfecting solution. Ends of all supply and internally insulated exhaust ducts shall be kept sealed until the time they are joined. When duct sections are joined, wipe down all interior surfaces with a clean tack cloth. If tack cloth shows any dust, then re-clean duct as described above. The intent is that no foreign matter be allowed to enter the ductwork at any time after factory cleaning and during construction.
  - 1. Unlined exhaust ducts shall be vacuum cleaned when installed, but shall otherwise be exempt from shop cleaning and sealing.

### 3.05 CONTROLS

- A. Installation of the system shall be made under the supervision of the manufacturer of the equipment, or his factory authorized representative.
- B. In addition to the submittals required above, and those set forth in "Submittals", the following items shall be furnished:
  - 1. Prior to final inspection, the system contractor shall furnish a letter stating that the entire control system and all "interlock" wiring is installed and operating in a satisfactory manner.
- C. Contractor shall include as a part of the work of this Section, a 1-year service contract on all portions of the control system.

### 3.06 CONTRACTOR RESPONSIBILITIES FOR TEST AND BALANCE

- A. Provide T&B agency one complete set of contract documents, change orders, and approved submittals in digital and hard copy formats. Project Schedule and Mechanical Contractor's Shop Drawings and Temperature Control Drawings shall be provided as issued or received.
- B. Controls contractor shall provide required BAS hardware, software, personnel and assistance to T&B agency as required to balance the systems. Controls contractor shall also provide trending report to demonstrate that systems are complete.
- C. Coordinate meetings and assistance from suppliers and contractors as required by T&B agency.
- D. Provide additional valves, dampers, sheaves and belts to properly test and balance, which shall be installed by the Mechanical Contractor as directed by T&B agency, at no additional cost to owner.
- E. Mechanical Contractor shall install test holes where indicated by the T&B Agency. Test holes shall be complete with removable and replaceable plugs
- F. Flag all manual volume dampers with fluorescent or other high-visibility tape.
- G. Provide access to all dampers, valves, test ports, nameplates and other appurtenances as required by T&B agency.
- H. Replace or repair insulation as required by T&B agency.
- I. Have the HVAC systems at complete operational readiness for T&B to begin. As a minimum verify the following:
  - 1. Airside:
    - a. All ductwork is complete with all terminals installed.

- b. All volume, smoke and fire dampers are open and functional.
  - c. Clean filters are installed.
  - d. All fans are operating, free of vibration, and rotating in correct direction.
  - e. VFD start-up is complete and all safeties are verified.
  - f. System readiness checklists are completed and returned to T&B agency.
- J. Maintain a construction schedule that allows the T&B agency to complete work prior to occupancy.
- K. Before testing or balancing is started, the Mechanical Contractor shall adjust belts and sheaves; align all parts; oil and grease bearings in accordance with manufacturer's instructions; clean exterior surfaces of coil tubes and fins; flush interior of coil tubes, pull until clean; and check mixing damper operation to insure free operation and activation by the correct thermostat
- L. The Mechanical Contractor shall be responsible for certifying in writing that the system, as scheduled for balancing, is operational and complete. Completeness shall include not only the physical installation, but the Mechanical Contractor's certification that the prime movers are installed in good working order, and that full load performance has been preliminary tested under the certification of the Mechanical Contractor. Before any testing and balancing is started, a complete report shall be sent to the T&B Agency by the Mechanical Contractor.
- M. The Mechanical Contractor shall be responsible for making all modifications to rectify discrepancies reported by the T&B Contractor as indicating non-compliance with the Contract Documents. By completing the work on time, the Mechanical Contractor shall provide sufficient time before the completion date so that balancing can be accomplished.

### **3.07 INSTALLATION, REFRIGERANT PIPING**

- A. Piping installation shall comply with all federal, state, and local regulations and industry guidelines. In addition, the following practices shall be followed.
- 1. All piping shall be stored with ends sealed to prevent entry of moisture and debris.
  - 2. All factory and field cut tube ends shall be de-burred and cleaned.
  - 3. When brazing, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties.
  - 4. Piping shall be continuously purged with dry nitrogen while brazing. Care shall be taken when brazing near valves or other equipment that may be damaged by extreme heat.
  - 5. Install refrigerant piping according to ASHRAE Standard 15, 2022.
  - 6. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
  - 7. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
  - 8. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
  - 9. Install piping adjacent to machines to allow service and maintenance.
  - 10. Install piping free of sags and bends.
  - 11. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
  - 12. Install fittings for changes in direction and branch connections.
  - 13. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection.
  - 14. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
  - 15. Install refrigerant piping in protective conduit where installed belowground. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical

injury.

16. Slope refrigerant piping as follows:

- a. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
- b. Install horizontal suction lines with a uniform slope downward to compressor.
- c. Use double-suction riser for maximum compressor efficiencies if load variation is expected.
- d. Install traps and double risers to entrain oil in vertical runs.
- e. Liquid lines may be installed level.

B. All refrigerant piping and valves shall be identified.

### 3.08 TESTS, INSPECTIONS

- A. Contractor shall not allow or cause any work of this Section to be covered or enclosed until it has been inspected, tested, and approved by the Architect and the authorities having jurisdiction over the Work. Should any of this work be enclosed or covered up before such inspection, testing, and approval, this Contractor shall uncover the work, have the necessary inspections, tests, and approvals made and, at NO expense to the Owner, make all repairs necessary to restore both his work and that of other contractors which may have been damaged to be in conformity with the Contract Documents.
- B. Furnish all necessary labor, materials, and equipment for conducting tests, and pay all expenses in connection therewith. Should leaks develop while testing, repairs shall be made, and tests shall be repeated until a satisfactory test is obtained.
- C. In any test, proper safety procedures and equipment shall be used, including personal protective equipment such as protective eyewear and clothing. Installers shall always consider local conditions, codes and regulations, manufacturer's installation instructions, and Architects' specifications in any installation.
- D. Make all necessary control adjustments and balancing of air and water flows. Operate the entire system for a period of time not less than 3 working days for the purpose of proving satisfactory performance. During this period, instruct such persons as the Owner and/or Architect may designate in the proper operation of the systems. Should further adjustment prove necessary, operating tests shall be repeated until a satisfactory test result is obtained.
- E. Acceptance Testing
  1. The California Energy Code Section 10-103 requires Acceptance Testing on all newly installed mechanical systems envelopes after installation and before project completion. An Acceptance Test is a functional performance test to help ensure that newly installed equipment is operating and in compliance with the Energy Code. The systems must pass the required acceptance criteria. Any deficiencies must be corrected by the installing contractor until the specified systems conform and pass the required acceptance criteria. As of October 2021, all mechanical system acceptance tests must be performed by a certified mechanical acceptance test technician (CMATT).
  2. A listing of certified ATT can be found at <https://www.energy.ca.gov/programs-and-topics/programs/acceptance-test-technician-certification-provider-program/acceptance>.
  3. The acceptance testing procedures must be repeated, and deficiencies must be corrected by the builder or installing contractor until the construction/installation of the specified systems conform and pass the required acceptance criteria. Project inspectors will collect the forms to confirm that the required Acceptance Tests have been completed.
- F. Condenser water piping shall be hydrostatically tested at 125-psi pressure and proved tight

before covering. Tests may be made in sections provided connection to service previously tested is included in each succeeding test. Systems shall be tight for eight hours.

G. Refrigerant Piping Testing

1. The Contractor shall notify the Owner's Representative 48 hours prior to the time and date of the evacuation.
2. Be sure that all controls, relief valves or rupture discs that could be damaged by test pressure are removed before beginning pressure test.
3. Prior to charging with refrigerant, piping shall be tested for leaks under 550 psi pressure using a mixture of 95% oxygen-free nitrogen and 5% hydrogen. (WARNING! OXYGEN OR ACETYLENE SHALL NOT BE USED IN PLACE OF DRY NITROGEN. A VIOLENT EXPLOSION MAY RESULT!). All joints shall be tested for leaks using an electronic hydrogen leak detector.
4. Pressure and leak tests on refrigeration piping and equipment shall be done in accordance with local code requirements and ASHRAE Standard 15-2022. Be sure that all controls, relief valves or rupture discs that could be damaged by test pressure are removed before beginning pressure test.
5. Precautions shall be taken to keep moisture out of the system, and a drier shall be used.
6. After successful completion of pressure tests, the entire system shall be purged with dry nitrogen and then evacuated with a standard vacuum pump to remove all moisture and non-condensibles. Three evacuations shall be required and shall be down to 500 microns absolute pressure. Break the first two vacuums with dry nitrogen. Charge with refrigerant after third evacuation. The Contractor shall notify the Owner's Representative 48 hours prior to the time and date of the evacuation.
7. The refrigerant charge shall be calculated and weighed into the system. After charging with refrigerant, all joints shall be tested with an electric hydrogen leak detector.
8. Mechanical joints in refrigerant piping systems are unacceptable. All refrigerant piping joints shall be brazed. Use silver solder, minimum 15% silver content.
9. Service technicians shall be certified in the use of CFC and HCFC refrigerant recovery and recycling equipment and shall use UL listed and labeled recovery equipment when discharging refrigerant.

**3.09 CLEANUP**

- A. Upon completion of the work of this Section, remove all material, debris, and equipment associated with or used in the performance of this Work.

**END OF SECTION**

## SECTION 23 0500

### GENERAL MECHANICAL

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Special Conditions and all Division 01 Specification Sections, apply to this Section.
- B. This Section includes the following:
  - 1. General requirements specifically applicable to all Division 23 Sections
  - 2. Some piping material and installation instructions common to most piping systems
  - 3. Mechanical demolition (when indicated on the Drawings)
  - 4. Concrete bases
  - 5. Supports and anchorages
  - 6. Pipe and equipment identification
  - 7. Basic electrical requirements
  - 8. Electric motors.
- C. This Section applies to all work of Division 23.

##### 1.02 QUALITY ASSURANCE

- A. Regulatory compliance: All work performed under Division 23 shall comply with the latest currently adopted editions of all codes, ordinances, and regulations, and all requirements of the Authorities Having Jurisdiction. Comply with provisions of the following, except as otherwise shown or specified.
  - 1. California Building Code (CBC)
  - 2. California Code of Regulations Titles 8, 17, 19, 20, 21 & 22
  - 3. California Electric Code (CEC)
  - 4. California Energy Code
  - 5. California Energy Conservation Code (Title 24)
  - 6. California Fire Code (CFC)
  - 7. California Green Building Standards Code
  - 8. California Mechanical Code (CMC)
  - 9. California Occupational Safety & Health Administration (CAL-OSHA)
  - 10. California Plumbing Code (CPC)
  - 11. California State Fire Marshall (CSFM)
  - 12. City Fire Marshal requirements
  - 13. National Fire Protection Association
  - 14. Other applicable state laws.
- B. Where material or equipment is specified to conform to referenced standards, the most recent edition of the standard in effect at the time of bid shall be used.
  - 1. Air Moving and Control Association, Inc. (AMCA)
  - 2. American Gas Association (AGA)
  - 3. American National Standards Institute (ANSI)
  - 4. American Society of Mechanical Engineers (ASME)
  - 5. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
  - 6. American Society for Testing and Materials (ASTM)
  - 7. Air-Conditioning and Refrigeration Institute (ARI)
  - 8. Associated Air Balance Council (AABC)

9. Canadian Standards Association International (CSA)
  10. National Electrical Manufacturers Association (NEMA)
  11. National Fire Protection Association (NFPA)
  12. Office of Statewide Health Planning and Development (OSHPD)
  13. Sheet Metal and Air Conditioning Contractors Nation Association (SMACNA) Standards
  14. Underwriters Laboratories (UL)
  15. Comply with all ADA requirements for disabled access.
- C. Minimum requirements: The requirements of these are the minimum that will be allowed unless such requirements are exceeded by applicable codes or regulations, in which the regulatory codes or regulation requirements shall govern.
- D. When the Contract Documents call for materials or construction of a higher standard than is required by the above, the Contract Document requirements shall take precedence over the requirements of the said laws, rules, and/or regulations, accepting that nothing in the Contract Documents shall be interpreted as permitting work in violation of said laws, rules, and/or regulations. The Contractor for this work shall furnish any additional materials and/or labor as may be required for compliance with these laws, rules, and/or regulations though such materials and/or labor are not specifically set forth in the Contract Documents, with no additional charges to Owner.
- E. Seismic construction and restraints shall be in accordance with the requirements of Title 24 of the California Code of Regulations. All equipment mounts, isolators, and hanging systems must meet local authority requirements.
- F. Comply with the Safety Orders issued by Cal-OSHA and any other regulations of the State of California and any districts having jurisdictional authority.

### 1.03 SUBMITTALS

- A. General:
1. All submittals shall be in accordance with the requirements of the General Conditions and Division 01 Sections for Submittal Procedures and Product Requirements.
  2. Before any fixtures, materials, or equipment are purchased, the Contractor shall submit to the Architect for approval, a complete list of materials, fixtures, and equipment, giving the manufacturers' names, catalog number, capacity, size, power requirements, and other pertinent data. Submittal lists and drawings shall be specifically applicable to this project, shall include identifying marks assigned by Specifications and Drawings, and shall not contain extraneous material or optional choices.
  3. Product names referenced in the specifications are used as standards of quality. Other materials shall not be used unless approved in writing. Review is required even though the term "or equal" is used. Review of submittals will be only for general conformance with design concept. Review will not include quantities, dimensions, construction methods, or coordination with the work of other trades.
  4. The Contractor shall submit for the approval of the Architect, shop drawings of proposed material and equipment that differ from the specified materials and equipment, and of any specified materials and equipment with special conditions and/or arrangements. These drawings shall show necessary modifications of Owner, plumbing, electrical and mechanical work required by the proposed materials and equipment.
  5. Refer to Division 01 for substitutions requirements.
  6. Contractor shall make all necessary field measurements and investigations to assure that the equipment and assemblies will meet contract requirements. Review of drawings and other material submitted shall not be construed as a complete check or constitute a waiver of the requirements of the Drawings and Specifications but will indicate that the material submitted

is acceptable in quality and utility. This review shall not relieve the Contractor of the responsibility to fit the proposed materials to the spaces provided, and to effect necessary rearrangement or construction of other work.

- B. Submit shop-wiring diagrams of temperature controls and air conditioning unit controls for approval. Furnish approved wiring diagrams and assistance to Electrician.

#### **1.04 WARRANTIES**

- A. In accordance with Division 01 and as follows. Refer to specific items of equipment specified for warranty duration if different from that specified in Division 01.
  - 1. Equipment warranties shall be provided for all equipment, with all necessary information filled in, except purchase date, in favor of the Owner.
  - 2. Provide new materials, equipment, apparatus and labor to repair or replace that determined to be defective or faulty.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Contractor shall be responsible for delivery, storage, protection and placing of all equipment and materials.
- B. Contractor shall protect the work and materials from damage during construction. Equipment stored at the jobsite shall be protected from dust, water or other damage, and be covered if equipment is exposed to weather. Protect interiors of new equipment and piping systems against entry of foreign matter. Clean both inside and outside before painting or placing equipment in operation.
- C. Any items damaged shall be repaired or replaced, at no additional cost to the Owner.
- D. Cleanliness of Piping and Equipment Systems:
  - 1. Exercise care in storage and handling of equipment and piping material to be incorporated in the work. Remove debris arising from cutting, threading and welding of piping.
  - 2. Piping systems shall be flushed, blown or pigged as necessary to deliver clean systems.
  - 3. Contractor shall be fully responsible for all costs, damage, and delay arising from failure to provide clean systems.

#### **1.06 COOPERATION WITH OTHER TRADES**

- A. Coordinate HVAC work with other trades doing work on the project as may be necessary for the proper completion of the project. Refer to the Structural, Plumbing, and Electrical Drawings for details of the building structure and equipment installation that will tend to overlap, conflict with, or require coordination with the work of this Section, and schedule this work accordingly.
- B. Priority of right of way in space shall be as follows, in decreasing order of authority:
  - 1. Electrical lights, electrical panels and drain piping.
  - 2. Ductwork.
  - 3. Fire protection piping, domestic hot water, domestic cold water and condenser water piping.
- C. Any work done without regard for other trades shall be moved, replaced, or redone as required, without extra charges to Owner.

#### **1.07 FEES AND PERMITS**

- A. Obtain and pay for permits and service required in installation of the Work. Arrange for required inspections and secure approvals from authorities having jurisdiction. Comply with requirements of Division 01.

## 1.08 UTILITIES CONNECTIONS

- A. Arrange for all utility connections, determine their exact requirements, and pay all costs incurred. Send proper notices, make necessary arrangements, and perform other services required for care and maintenance of all utilities and assume all responsibility concerning same. Observe all rules and regulations of the respective utilities in executing the work.

## 1.09 ELECTRICAL REQUIREMENTS

- A. Electrical work in this Section shall conform to the requirements of Division 26. Equipment shall conform to the standards of the National Electric Manufacturer's Association. Electrical equipment shall bear the label of Underwriters' Laboratories, Inc. where examination and listing service is available for such materials. Motors and motor control equipment shall be as specified herein.
- B. Refer to Division 26 for conduit fittings and devices, service voltage and power feed wiring, and control and interlock wiring for equipment specified under this Section. Contractor shall have responsibility to verify that electrical services provided are adequate and compatible with equipment requirements.
- C. Electrical work shall include the furnishing of:
  - 1. Duct mounted smoke detectors
  - 2. Motor starters, 3-phase
  - 3. Disconnects/circuit breakers, unless specifically called for in equipment schedules or specifications to be factory installed with equipment
  - 4. Smoke control interlocks to HVAC fans
  - 5. Electrical systems
  - 6. Power wiring, including raceway, fittings, wire, boxes and related items, all voltages, that is not part of Controls Contractor work
  - 7. Control & interlock wiring that is not part of Controls Contractor work.
- D. Electrical work shall include the installing of:
  - 1. All smoke detectors, except duct mounted
  - 2. Smoke control interlocks to HVAC fans
  - 3. Variable speed drives, field mounted
  - 4. Motor starters, 3-phase
  - 5. Disconnects/circuit breakers, unless specifically called for in equipment schedules or specifications to be factory installed with equipment
  - 6. Electrical systems
  - 7. Low voltage wiring, line voltage "interlock" wiring, control wiring for safety devices, alarms, and refrigeration
- E. Controls Contractor shall furnish and install:
  - 1. Refrigerant leak detectors, including control & interlock wiring
  - 2. Control system network backbone
  - 3. Window switches
  - 4. Control panels
  - 5. Control devices
  - 6. Control damper actuators
  - 7. Terminal box control transformer panels
  - 8. Digital controller and damper actuator
  - 9. Air-flow measurement transducer and piping
  - 10. Wall sensor modules
- F. Controls Contractor shall furnish, and Mechanical Contractor shall install:



1. Automatic isolation and control valves
  2. Sensor wells, meters, and other pipe-mounted control devices
- G. Wiring includes all connections to devices, and all wiring shall be installed in conduit.
1. Conduit fittings and devices shall be as specified in the basic electrical materials section of Division 26.
  2. Line voltage work (in equipment assemblies) shall be as specified in Division 26.
- H. Devices shall be installed in NEMA enclosures of type required for location.
- I. Electrical Controls:
1. Refer to Electrical, Fire Protection, Plumbing and Mechanical documents for work and devices required.
- J. The following work will be furnished and installed under Division 26.
1. Disconnect switches, remote switches, motor starters, relays and test switches not mounted as integral part of equipment assemblies or in temperature control panels.
  2. All line voltage controls and interlocks, all other controls, circuits from electric panel board to disconnect switches, starters, motors, switches and/or other motor controls, to temperature controls and safety devices.

#### **1.10 DAMAGE BY LEAKS**

- A. Contractor shall be responsible for any damage to work of other Contractors that is caused by leaks in any temporary or permanent piping systems due to pipe rupture, disconnected pipes or fittings, or by overflow of equipment.
- B. Patching and replacing of damaged work shall be done by the Contractor who installed the work, as directed by the Architect, but the cost of same shall be paid by the Contractor who is responsible for the damage.

#### **1.11 LICENSING REQUIREMENTS**

- A. All work of Division 23 shall be performed by an appropriately licensed Contractor, licensed in the state of California. The licenses shall be current, valid through the term of the contract, and in the name of the Contractor. Refer to the Contractors State License Board for a description of classifications.
  1. HVAC work, which includes warm-air heating systems and water heating heat pumps, complete with warm-air appliances; ventilating systems complete with blowers and plenum chambers; air-conditioning systems complete with air-conditioning unit; and the ducts, registers, flues, humidity and thermostatic controls and air filters in connection with any of these systems, shall be performed by a C-20 - Warm-Air Heating, Ventilating and Air-Conditioning Contractor.

### **PART 2 PRODUCTS**

#### **2.01 PRODUCTS CRITERIA**

- A. All materials, appliances, and equipment shall be new and best of their respective kinds, free from defects, and of the make, brand or quality specified or as accepted by the Architect.
- B. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be products of one manufacturer.
- C. Apply and install all items in accordance with the manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the contract drawings and specifications to

the Architect for resolution.

## 2.02 HANGERS, SUPPORTS

- A. Piping - General
  - 1. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for un-insulated copper piping systems.
  - 2. Hangers and supports shall be designed and manufactured in conformance with ANSI/MSS SP-58. Selection and application shall be in accordance with ANSI/MSS SP-69.
  - 3. All piping shall be supported with Superstrut, B-Line, Anvil, Mifab, or approved equal pipe hangers and supports. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with shield for insulated piping.
  - 4. All hangers shall be electro-chromate or corrosion resistant finished. Hanger rods shall have electro-galvanized finish.
- B. Roof top pipe supports
  - 1. MiFab "C-Port" series or B-Line "Dura-Block" or approved equal.
    - a. Model C rubber support series with 14-gauge galvanized channel.
    - b. Seismic: Model CZ rubber base with 14-gauge galvanized channel
- C. Copper tubing:
  - 1. B-Line 3690, Superstrut C-711 or Anvil Figure 67 "J" pipe hangers or approved equal, complete with isolator.
  - 2. Isolators: B-Line "Vibra Cushion" B1999, Type L & K for copper tubing, Superstrut C-716 isolator for copper, Anvil Figure CT-769 or approved equal
- D. Insulated pipe:
  - 1. Hangers: B-Line 3690 "J" pipe hanger, Superstrut C -711, or Anvil Figure 67 fitted to outside of insulation or approved equal
  - 2. Pipe Shields: B-Line 3151 insulation protection shield, Superstrut C-790, or Anvil Figure 167 or approved equal
- E. Point of support connectors:
  - 1. Wood construction:
    - a. Stationary pipes: B-Line B3060, Superstrut 540 or Anvil Figure 206 side beam hanger clip or approved equal
    - b. Pipes subject to movement: B-Line B-756 or Superstrut S-541 beam clamp swing connector or approved equal
  - 2. New concrete construction: B-Line B2501 light duty spot inserts or Superstrut 452-TB spot inserts or approved equal.
  - 3. Existing concrete construction: Phillips "Red-Head" 3-piece concrete anchors or Hilti "Quik-Bolt", drilled-in, concrete anchors.
  - 4. Steel beams: Series 500 beam brackets.
  - 5. Plywood decks: machine bolts, nuts and washers.
- F. Vertical pipe risers:
  - 1. Riser clamps: Superstrut C-720 extension riser clamps anchored to construction
  - 2. Bare cold water pipe: Superstrut C-720P, PVC coated to prevent corrosion
- G. Insulated pipe supports: K.B. Enterprises "Snapp Itz".
- H. Pipes through studs or joists shall be isolated from structure with properly sized Hubbard "Hold-Rite" suspension clamps or LSP "Acousto-Plumb" system.
- I. Ductwork

1. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
2. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
3. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
4. Steel Cable End Connections: Steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
5. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
6. Trapeze and Riser Supports:
  - a. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
  - b. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
  - c. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

## 2.03 PIPE LABELS

- A. Brady, Seton, Graphic Products, or approved equal pipe labels. Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- C. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
- D. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
- E. Label Sizes (per ANSI A13.1 / ASME A13.1-2015 Standards):
  1. For pipes or covering with outside diameter  $\frac{3}{4}$  to  $1\frac{1}{4}$  inches, minimum length of label: 8 inches, minimum height of letters:  $\frac{1}{2}$  inch.
  2. For pipes or covering with outside diameter  $1\frac{1}{2}$  to 2 inches, minimum length of label: 8 inches, minimum height of letters:  $\frac{3}{4}$  inch.
  3. For pipes or covering with outside diameter  $2\frac{1}{2}$  to 6 inches, minimum length of label: 12 inches, minimum height of letters:  $1\frac{1}{4}$  inch.
- F. Pipe Label Color Schedule: (per ANSI A13.1 / ASME A13.1-2015)
  1. Potable, Cooling, Boiler Feed and Other Water Piping:
    - a. Background Color: Green.
    - b. Letter Color: White.
  2. Fire Quenching Fluids:
    - a. Background Color: Red.
    - b. Letter Color: White.
  3. Toxic or Corrosive Fluids:
    - a. Background Color: Orange.
    - b. Letter Color: Black
  4. Flammable or Oxidizing Fluids:
    - a. Background Color: Yellow.
    - b. Letter Color: Black.
  5. Combustible Fluids:
    - a. Background Color: Brown.
    - b. Letter Color: White
  6. Compressed Air:

- a. Background Color: Blue.
- b. Letter Color: White.

G. Duct Markers:

1. Self-adhesive duct markers with arrow indicating flow direction

## 2.04 ELECTRIC MOTORS

- A. With exception of motors in UL labeled equipment, motors for HVAC blowers and fans, pumps, and other general purpose applications using an adjustable speed drive shall be Baldor Premium Efficient Super-E®, three phase, foot mounted, Class H insulated motor with AEGIS shaft grounding ring installed internally, re-greasable ball bearings, dynamically balanced rotors.
- B. Motors shall be certified for quiet operation and shall bear a label so stating. Motors shall be drip-proof frame, 1.15 minimum service factor in 40°C, ambient windings specially impregnated and epoxy coated for outdoor service.
- C. Torque characteristics of motors shall be as required to accelerate machine to 100% full load speed within 10 seconds. Motors shall be dynamically balanced to maximum deflection as follows:
  1. 15 HP and larger: 0.0003 inches.
  2. 10 HP and smaller: 0.0002 inches.
- D. Motors shall be Inverter duty, meet NEMA MG-1 and part 30 and 31, and shall be guaranteed to satisfactorily operate at ± 10% voltage shown on Drawings. Transformers of adequate capacity shall be provided, if necessary, to satisfy this requirement.
- E. All 3-phase motors shall be provided with phase and brown-out protection to shut down all motors in the unit if the phases are more than 10% out of balance on voltage or the voltage is more than 10% under design voltage.
- F. Fractional horsepower fan motors (¼ hp, ½ hp, ¾ hp) shall be Greenheck “Vari-Green” series motors, DC electronic commutation type, specifically designed for fan applications. Motors shall be permanently lubricated with heavy duty ball bearings to match the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor. Motor shall be controllable down to 20% of full speed (80% turndown). Speed shall be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal. Motor shall be a minimum of 85% efficient at all speeds.
- G. Provide fan drives rated at 150% of motor horsepower. Drives shall be adjustable sheave type unless specified otherwise. Listed fan speeds are only approximate; select and/or change drives to operate at approximately midpoint of adjustable range after final balancing.

## PART 3 EXECUTION

### 3.01 PROJECT CONDITIONS

- A. Prior to commencing the work of this Section, the Contractor shall inspect the installed work of other trades and verify that their work is sufficiently complete to permit the start of work under this Section, and that the completed work will be in complete accordance with the original design. In the event of discrepancy, immediately notify the Architect and proceed as directed.

### 3.02 INSTALLATION, GENERAL

- A. Provide all necessary sleeving, core drilling, carpentry, cutting and patching required for proper installation of material and equipment specified.

- B. No structural members shall be drilled, bored, or notched in a manner that will impair their structural capacity. No structural cutting or drilling shall be done without the approval of the Architect and DSA.
- C. All penetrations of concrete or masonry shall be made with core drills.

### **3.03 POLLUTANT CONTROL**

- A. At the time of rough installation, or during storage on the construction site and until final startup of the heating and cooling equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal, or other methods acceptable to the enforcing agency to reduce the amount of dust or debris which may collect in system.

### **3.04 EQUIPMENT**

- A. Equipment shall operate quietly and without objectionable vibration. Such problems, other than from equipment operating at optimum conditions, shall be the Contractor's responsibility and shall be eliminated at the direction of the Architect.
- B. Install equipment to provide good appearance, easy access, and adequate space to allow replacement and maintenance. Provide bases, supports, anchor bolts, and other items required to achieve this. Installation shall be level, above moisture level, and adequately braced.
- C. Extend ¼" schedule 40 black steel lubrication pipes from hard-to-reach locations to front of equipment or to access doors. Terminate with proper lubrication fittings.
- D. Move equipment into building through available openings. Dismantle equipment where necessary to accomplish this. After reassembly, test equipment to verify its satisfactory operating condition.
- E. Thoroughly lubricate equipment before operating. Repair of damage resulting from failure to comply with this requirement shall be the Contractor's responsibility.
- F. Connections to piping shall be secured and properly aligned and all utility and control connections shall be properly isolated from the building structure by means of vibration isolators and flexible connections. Any equipment not meeting this requirement will be modified and properly reinstalled at no expense to the Owner.

### **3.05 ACCESS**

- A. All items that require access, such as for operating, cleaning, servicing, maintenance, and calibration shall be easily and safely accessible by persons standing at floor level, or standing on permanent platforms, without the use of portable ladders. Examples of these items include but are not limited to all types of valves, filters and strainers, transmitters and control devices. Prior to commencing installation work, refer conflicts between this requirement and contract Drawings to Architect for resolution.

### **3.06 MECHANICAL SERVICES**

- A. Terminals and services weighing no more than 20 pounds, may be supported directly on the runners of a heavy-duty grid system but, in addition, they must have a minimum of (2) #12-gauge slack safety wires attached at diagonally opposite corners and anchored to the structure above.

### **3.07 CONCRETE EQUIPMENT BASES**

- A. Concrete work that is part of the mechanical installations, as such is shown and/or detailed on the

Drawings, shall conform to the requirements of the Concrete Section of these Specifications.

- B. Concrete bases: Anchor equipment to concrete base according to equipment details on mechanical and structural Drawings. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
- C. Bases shall be neatly finished, have rounded corners and smooth trowel finish.

### 3.08 PAINTING

- A. Properly prepare work to be painted per the requirements of Division 09, except preservative and special painting as described herein. Priming shall conform to Division 09 requirements and be of a material compatible with paint for finish painting.
- B. All equipment and materials shall be cleaned of grease, wax, oil, rust or dirt in preparation for finish painting. Any prime coated surfaces showing signs of rust before being finish painted shall be thoroughly cleaned and a new prime coat applied.
- C. Equipment in equipment rooms and like spaces, shall be furnished with a factory applied baked prime coat or at Contractor's option, a standard factory baked enamel finish in approved colors. Machinery such as fans, or motors shall be furnished with a factory applied baked on prime coat, or at the Contractor's option, a standard paint finish (air dried or baked enamel) in approved colors. Mechanical equipment in other locations shall be furnished with a factory applied baked prime coat, unless noted otherwise.
- D. Paint interior of ductwork at air outlets with one coat of flat black paint.
- E. Prime paint both sides of flashings prior to installation.
- F. Furnish can of touch up paint with each factory finished piece of equipment.
- G. Paint all piping in mechanical rooms. Color as selected by the Architect.
- H. Black steel piping exposed to the environment shall be painted with rust-inhibiting paint. Color as selected by Architect.

### 3.09 IDENTIFICATION OF SYSTEMS

- A. Nameplates
  - 1. Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.
- B. Piping
  - 1. All piping shall be identified. Attach arrows at one or both ends of the marker to indicate flow direction
  - 2. If the pipe being labeled contains multiple hazards, determine which has the greatest hazardous risk and label accordingly.
  - 3. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces, machine rooms, accessible maintenance spaces such as shafts, tunnels, and plenums, and exterior exposed locations as follows:
    - a. Adjacent to all valves and flanges
    - b. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
    - c. At both sides of wall or floor penetrations.
    - d. Before and after all wall, floor and ceiling penetrations and inaccessible enclosures.
    - e. Adjacent to changes in direction.

- f. At access doors, manholes, and similar access points that permit view of concealed piping.
  - g. Near major equipment items and other points of origination and termination.
  - h. Spaced at maximum intervals of 25 feet along each run. Reduce intervals to 20 feet in mechanical rooms and other areas of congested piping and equipment, in spaces
- C. Ductwork
1. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 25 **feet** in each space where ducts are exposed or concealed by removable ceiling system.
    - a. Exposed ductwork shall be identified every 20 feet in mechanical rooms. with removable ceilings, and at each access door in spaces with hard ceilings.
- D. Valves
1. For identification and Owner's maintenance records, all valves shall be numbered and identified with clearly stamped 1¼" diameter brass tags, in accordance with drawings and service performed.
  2. Control valves shall be also marked whether normally open (N.O.) or normally closed (N.S.).
- E. Equipment
1. All equipment shall be labeled with 1" high stencils showing identifying mark noted on drawings, and usage.
  2. Warning signs shall be placed on machines driven by electrical motors that are controlled by fully automatic starters, per California Code of Regulations, Title 8, Subchapter 7 - General Industry Safety Orders, Article 7, Section 3320.
- F. A typewritten schedule of all nameplates and valve tags used, with identification, shall be framed and posted in mechanical rooms, at locations as directed.

### 3.10 SEISMIC RESTRAINT

- A. Equipment:
1. Each piece of equipment installed under these sections shall be constructed and anchored to structural supports to resist a seismic force of 150% of the equipment's operating weight in any direction. Supports, anchors, and braces shown shall be minimum.
  2. Equipment manufacturer shall design, construct, and certify that his equipment satisfies the special minimum seismic resistance requirements and shall submit calculations or test results supporting his certification.
- B. Vibration
1. All rotating mechanical equipment and associated piping and duct work shall be mounted by vibration isolators as required to minimize transmission of vibrations and noise to building structures or spaces.
  2. All rotating equipment shall be balanced both statically and dynamically.
  3. To minimize alignment problems, all motors over 5 hp must be designed to be solidly attached to a common base with the driven unit.
  4. In order to minimize vibration, solid sheaves and band belts shall be designed to be used in multiple V-belt driven equipment over 15 hp
- C. Isolation of Equipment
1. Isolation shall be designed to be stable during starting and stopping of equipment without any transverse and eccentric movement of equipment that would damage or adversely affect operation of the equipment or appurtenances.
  2. Isolation shall be designed for the operating speed of the equipment.
  3. Isolators, including springs, exposed to the weather shall be hot dipped galvanized after fabrication. Hot dipped zinc coating shall comply with ASTM Method A-123 and shall not be

- less than 2 oz per square foot.
4. Isolators shall be selected and located to produce uniform loading and deflection even when equipment weight is not evenly distributed.
  5. Isolation equipment includes neoprene pads, hanger spring and neoprene, travel limited floor spring and neoprene, inertia base, flexible duct connections, flexible pipe connections, thrust limits, grommets, and snubbers.
- D. Seismic Control and Restraint
1. Brace or anchor mechanical equipment to resist horizontal forces acting in any direction using the latest editions of the CBC and ASCE.
  2. Seismic-restraint devices shall meet CBC seismic restraint requirements, shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPM number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- E. Ductwork:
1. All ductwork shall be supported in accordance with the recommendations and requirements of the SMACNA Duct Construction Standards, latest Edition, with the exception of strap hangers and trapeze hangers, which shall have bracing capable of resisting a seismic force equal to 100% of the weight of the duct system in any direction. (Seismic force shall be in addition to static loading.)
- F. Piping:
1. Flexibility of piping systems must be maintained by using flexible devices at critical points at junctions of separate building structures. Braces or anchors shall be designed to damp oscillations or check excessive movement. Flexible devices for piping of gas shall be loops or offsets. Flexible devices for other piping may be loops, Victaulic grooved, or roustabout couplings.
  2. Piping at tops and bottoms of risers are critical points where flexibility is required, as well as at changes in direction on long runs of piping 4" and larger. Tops of risers shall be restrained from motion in horizontal direction, and midpoints shall be anchored in all directions.

### 3.11 INSTALLATION - HANGERS AND SUPPORTS

- A. Pipe supports shall be spaced according to CMC 2019, Table 313.3 and sufficiently close to support pipes properly without formation of pockets. Hangers shall be installed at ends of mains and branches.
- B. Refrigerant piping shall be supported per CMC 1105.2 and 1109.6.
- C. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- D. No valve or piece of equipment shall be used to support piping.
- E. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- F. Install lateral bracing with pipe hangers and supports to prevent swaying.
- G. Install building attachments within concrete slabs or attach to structural steel. Install additional



attachments at concentrated loads, including valves, flanges, and strainers, 2-½ inches and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

- H. Metal Pipe-hanger Installation: Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- I. Metal Trapeze Pipe-Hanger Installation: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
- J. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Insulated Piping:
  - 1. Attach clamps and spacers to piping.
    - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
- M. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
- N. Ductwork
  - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
  - 2. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at maximum intervals of 16 feet.
  - 3. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

### **3.12 CLEANING OF PIPING**

- A. All new piping shall be thoroughly cleaned of rust, scale, etc., prior to enclosing and placing in operation. Water shall be forced through pipes until the systems are free from foreign substances.

### **3.13 CLEANUP**

- A. Upon completion of the work, remove all material, debris, and equipment associated with or used in the performance of this work.

**END OF SECTION**

## SECTION 23 0593

### TESTING, ADJUSTING, AND BALANCING FOR HVAC

#### PART 1 GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### 1.02 SUMMARY

- A. Section Includes:
  - 1. Balancing Air Systems
  - 2. Additional Tests:
    - a. Duct leakage testing
    - b. Controls verification

##### 1.03 SCOPE

- A. The Testing, Adjusting, & Balancing (T&B) Agency will provide the following services:
  - 1. Provide all supervision, personnel, instruments, calibration equipment, and all other materials necessary to perform balancing and testing, and compile test data including calculations and services necessary for the heating, ventilating, and air conditioning systems for this project, all in accordance with the project Drawings and Specifications and as specified herein.
  - 2. The T&B Agency shall be responsible for inspecting, balancing, adjusting, testing, and logging the data of the performance of fans, all dampers in the duct systems, all air distribution devices or heat exchangers, and the flows of water through all coils.
  - 3. The T&B Agency shall balance, test, and adjust the systemic components to obtain optimum conditions in each conditioned space in the building. If construction deficiencies are encountered which preclude obtaining optimum conditions, the deficiencies will be recorded and given to the Owner's Representative. The T&B Agency is advised that deficiencies in the HVAC construction are often encountered during final T&B services and should include in the bid an amount deemed advisable to compensate for time in identifying the deficiencies.
- B. During construction, the T&B Contractor shall inspect the installation of pipe systems, sheet metal work, temperature controls, and other component parts of the HVAC systems. Inspections shall be conducted a minimum of three times. Typically, this is performed when 60% of the ductwork and piping are installed and again when 90% of the total system is installed and prior to insulation. A copy of the written report is to be issued to the Mechanical Engineer for review.

##### 1.04 SUBMITTALS

- A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit T&B strategies and step-by-step procedures.
- B. System Readiness Checklists: Within 30 days of Contractor's Notice to Proceed, submit system readiness checklists for use by systems installers in verifying system readiness for T&B.
- C. Examination Report: Within 30 days of Contractor's Notice to Proceed, provide a summary report of any issues that are discovered that may preclude the proper testing and balancing of the systems.

- D. Certified T&B reports: Within 30 days of completion of balancing work, submit AABC-certified T&B report.
  - 1. Submit one copy of the final T&B Report directly to the Architect. Provide five additional copies to the Contractor.

#### 1.05 QUALITY ASSURANCE

- A. T&B Contractor Qualifications:
  - 1. General Contractor will employ a T&B Agency that is certified by the Associated Air Balancing Council (AABC). The T&B Agency will have experience in the field of air and hydronic system balancing, possess calibrated instruments, and employ qualified Supervisors and skilled Technicians to perform all required tests. The T&B Agency shall have a minimum of 10 years of experience in the Testing, Adjusting, and Balancing field.
- B. T&B technician shall perform the following:
  - 1. Review field data reports to validate accuracy of data and to prepare certified T&B reports.
  - 2. Certify that the T&B team complied with the approved T&B plan and the procedures specified and referenced in this Specification.
  - 3. Certify the T&B report
- C. T&B Conference: If requested by the Architect or Construction Manager after approval of the T&B Agency's submittals, meet to develop a mutual understanding of the details
  - 1. Agenda Items:
    - a. The examination report.
    - b. The Strategies and Procedures plan.
    - c. Systems readiness checklists.
    - d. Coordination and cooperation of trades and subcontractors.
    - e. Coordination of documentation and communication flow.
- D. Approved Test and Balance agencies in the area:

**RS Analysis, Inc.**

Corporate Office  
1035 Suncastr Lane, Suite 130  
El Dorado Hills, CA 95762  
(888) 330-1935  
South San Francisco Branch (650) 583-9400  
www.rsanalysis.com

**National Air Balance Company, Inc.**

4171 Business Center Drive  
Fremont, CA 94538  
(510) 623-7000  
www.nabco.biz

**Raglen System Balance, Inc.**

(775) 747-0100 (main office)  
www.raglensystembalance.com

**Pacific Test & Balance, Inc.**

4771 Mangels Blvd.  
Fairfield, CA 94534  
(707) 696-2444  
www.pacifictab.com

- E. T&B Report Forms: Use standard T&B contractor's forms.

- F. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in “AABC National Standards for Total Systems Balance.”

## **PART 2 PRODUCTS (NOT USED)**

## **PART 3 EXECUTION**

### **3.01 EXAMINATION & REVIEW**

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper T&B of systems and equipment.
- B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Note the locations of devices that are not accessible for testing and balancing.
- C. Review the Contractor shop drawing submittals for their effect on the test and balance process and overall performance of the HVAC system. Submit recommendations for enhancements or changes to the system.
- D. Review location and type of volume damper inlet conditions to air terminals and HVAC equipment.
- E. Review location of pressure sensors in the air distribution system.
- F. Review automatic control systems as they affect the test and balance procedure.
- G. Review sheet metal and piping shop drawings to verify the installation of flow control devices.
- H. Review the approved submittals for HVAC systems and equipment.
- I. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas.
- J. Review equipment performance data including fan and pump curves.
- K. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, clean permanent filters are installed, and controls are ready for operation.
- L. Examine two-way valves for proper installation and function.
- M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

### **3.02 PREPARATION**

- A. Prepare a T&B plan that includes:
  - 1. Equipment and systems to be tested.
  - 2. Strategies and step-by-step procedures for balancing the systems.
  - 3. Instrumentation to be used.
  - 4. Sample forms with specific identification for all equipment.
- B. Prepare system-readiness checklists, as described in the *AABC National Standards for Total System Balance*, for use by contractors in verifying system readiness for T&B. These shall include, at a minimum:
  - 1. Airside:
    - a. All ductwork is complete with all terminals installed.
    - b. All volume, smoke and fire dampers are open and functional.
    - c. Clean filters are installed.
    - d. All fans are operating, free of vibration, and rotating in correct direction.
    - e. VFD start-up is complete and all safeties are verified.

- f. Automatic temperature-control systems are operational.
- g. Ceilings are installed.
- h. Windows and doors are installed.
- i. Suitable access to balancing devices and equipment is provided.

### **3.03 GENERAL PROCEDURES FOR TESTING AND BALANCING**

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and in this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for T&B procedures.
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

### **3.04 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS**

- A. Prepare test reports for both fans and outlets. Obtain approved submittals and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare single-line schematic diagram of systems for the purpose of identifying HVAC components.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check condensate drains for proper connections and functioning.
- H. Check for proper sealing of air-handling-unit components.

### **3.05 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS**

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
  - 1. Measure total airflow.
    - a. Set outside air, return air and relief air dampers for proper position that simulates minimum outdoor air conditions.
    - b. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
    - c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
    - d. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
  - 2. Measure fan static pressures as follows:
    - a. Measure static pressure directly at the fan outlet or through the flexible connection.
    - b. Measure static pressure directly at the fan inlet or through the flexible connection.
    - c. Measure static pressure across each component that makes up the air-handling system.
    - d. Report any artificial loading of filters at the time static pressures are measured.

3. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.
  1. Measure airflow of submain and branch ducts.
  2. Adjust sub-main and branch duct volume dampers for specified airflow.  
Re-measure each sub-main and branch duct after all have been adjusted.
- C. Adjust air inlets and outlets for each space to indicated airflows.
  1. Set airflow patterns of adjustable outlets for proper distribution without drafts.
  2. Measure airflow at all inlets and outlets.
  3. Adjust each inlet and outlet for specified airflow.
  4. Re-measure each inlet and outlet after all have been adjusted.
- D. Verify final system conditions.
  1. Re-measure and confirm minimum outdoor air, return and relief airflows are within design. Readjust to design if necessary.
  2. Re-measure and confirm total airflow is within design.
  3. Re-measure all final fan operating data, rpms, volts, amps, static profile.
  4. Mark all final settings.
  5. Test system in economizer mode. Verify proper operation and adjust, if necessary.
  6. Measure and record all operating data.
- E. Record final fan-performance data

### 3.06 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

- A. Adjust the variable-air-volume systems as follows:
  1. Verify that the system static pressure sensor is located 2/3 of the distance down the duct from the fan discharge.
  2. Verify that the system is under static pressure control.
  3. Select the terminal unit that is most critical to the supply-fan airflow. Measure inlet static pressure and adjust system static pressure control setpoint so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
  4. Calibrate and balance each terminal unit for maximum and minimum design airflow as follows
    - a. Adjust controls so that terminal is calling for maximum airflow (note some controllers require starting with minimum airflow. Verify calibration procedure for specific project).
    - b. Measure airflow and adjust calibration factor as required for design maximum airflow. Record calibration factor.
    - c. When maximum airflow is correct, balance the air outlets downstream from terminal units.
    - d. Adjust controls so that terminal is calling for minimum airflow.
    - e. Measure airflow and adjust calibration factor as required for design minimum airflow. Record calibration factor. If no minimum calibration is available, note any deviation from design airflow.
    - f. When in full cooling or full heating, ensure that there is no mixing of hot deck and cold deck airstreams unless so designed.

- g. On constant volume terminals, in critical areas where room pressure is to be maintained, verify that the airflow remains constant over the full range of full cooling to full heating. Note any deviation from design airflow or room pressure.
5. After all terminals have been calibrated and balanced, test and adjust system for total airflow. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.
  - a. Set outside air, return air and relief air dampers for proper position that simulates minimum outdoor air conditions.
  - b. Set terminals for maximum airflow. If system design includes diversity, adjust terminals for maximum and minimum airflow so that connected total matches fan selection and simulates actual load in the building.
  - c. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
  - d. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
  - e. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
6. Measure fan static pressures as follows:
  - a. Measure static pressure directly at the fan outlet or through the flexible connection.
  - b. Measure static pressure directly at the fan inlet or through the flexible connection.
  - c. Measure static pressure across each component that makes up the air-handling system.
  - d. Report any artificial loading of filters at the time static pressures are measured.
7. Set final return and outside airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
  - a. Balance the return-air ducts and inlets the same as described for constant-volume air systems.
  - b. Verify all terminal units are meeting design airflow under system maximum flow.
8. Re-measure the inlet static pressure at the most critical terminal unit and adjust the system static pressure setpoint to the most energy-efficient setpoint to maintain the optimum system static pressure. Record setpoint and give to controls contractor.
9. Verify final system conditions as follows:
  - a. Re-measure and confirm minimum outdoor air, return and relief airflows are within design. Readjust to design if necessary.
  - b. Re-measure and confirm total airflow is within design.
  - c. Re-measure all final fan operating data, rpms, volts, amps, static profile.
  - d. Mark all final settings.
  - e. Test system in economizer mode. Verify proper operation and adjust, if necessary. Measure and record all operating data.
  - f. Verify tracking between supply and return fans.

### **3.07 PROCEDURES FOR MULTIZONE SYSTEMS**

- A. Position the unit's automatic zone dampers for maximum flow through the cooling coil.
- B. The procedures for multi-zone systems will follow the procedures for constant volume systems, utilizing the zone balancing dampers to achieve the indicated airflow within the zone.
- C. After balancing, place the unit's automatic zone dampers for maximum heating flow. Retest zone airflows and record any variances.

### **3.08 PROCEDURES FOR CONDENSING UNITS**

- A. Verify proper rotation of fans.

- B. Measure entering- and leaving-air temperatures.
- C. Record fan and motor operating data.

### 3.09 TOLERANCES

- A. Set HVAC system's air flow rates within the following tolerances:
  - 1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
  - 2. Air Outlets and Inlets: Plus or minus 10 percent.
  - 3. Minimum Outside Air: Zero to plus 10 percent.
- B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

### 3.10 ADDITIONAL TESTS

- A. Duct Leakage Test
  - 1. All ductwork shall be tested for leaks, using necessary instruments before insulating any ductwork. Conduct test as follows and as recommended in SMACNA Balancing Manual.
    - a. Seal all openings in duct section and plenum to be tested.
    - b. Connect test apparatus to test section of cuts, using a flexible duct connection or hose (fitting provided by Mechanical Contractor).
    - c. Close damper on blower suction side, to prevent excessive build-up of pressure.
    - d. Start blower and gradually open damper on suction side of blower.
    - e. Determine amount of air leakage and make repairs as required.
    - f. Leakage factor allowable shall be 5% based on the total operating cfm of the section of duct under testing.
    - g. Tested sections of ductwork shall be visually marked with certification sticker and initials of field test inspector. Tests shall be made before duct sections are concealed.
  - 2. Witness the duct pressure testing performed by the mechanical/installing contractor.
  - 3. Verify that proper test methods are used and that leakage rates are within specified tolerances.
  - 4. Report any deficiencies observed.
- B. Controls Verification
  - 1. In conjunction with system balancing perform the following:
    - a. Work with the temperature control contractor to ensure the system is operating within the design limitations and gain a mutual understanding of intended control performance.
    - b. Verify the integrity of valves and dampers in terms of tightness of close-off and full-open position. This includes dampers in multi-zone units.
    - c. Check that all valves are properly installed in the piping system in relation to direction of flow and location.
    - d. Verify the proper application of all normally open and normally closed valves.
    - e. Check the locations of all thermostats and humidistats for potential erratic operation from outside influences such as sunlight, drafts or cold walls.
    - f. Check the locations of all sensors to determine whether their position will allow them to sense only the intended temperatures, humidities, or pressures. Control Contractor will relocate as deemed necessary by the TAB Agency.
    - g. Check the sequence of operation for any control mode is in accordance with approved shop drawings. Verify that only minimum simultaneous heating and cooling occurs. Observe that heating cannot take place until the cooling zone of valve is completely closed.
    - h. Verify that all controller set points meet the design intent.



- i. Verify the operation of all interlock systems.
  - j. Verify that controllers are calibrated and function as intended.
  - k. Verify that controller setpoints are as specified.
  - l. Verify the operation of lockout or interlock systems.
  - m. Verify the operation of all valve and damper actuators.
  - n. Verify that all controlled devices are properly installed and connected to the correct controller.
  - o. Verify that all controlled devices travel freely and are in the position indicated by the controller: open, closed, or modulating.
  - p. Perform all system verification to assure the safety of the system and its components.
2. Reporting
    - a. The report shall include a summary of verifications performed, remaining deficiencies, and any variations from specified conditions.
  3. A systematic check of the above requirements shall be included in the final TAB report.

### **3.11 FINAL TEST AND BALANCE REPORT**

- A. The report shall be a complete record of the HVAC system performance, including conditions of operation, items outstanding, and any deviations found during the T&B process. The final report also provides a reference of actual operating conditions for the owner and/or operations personnel. All measurements and test results that appear in the reports must be made on site and dated by the AABC technicians or test and balance engineers.
- B. The report must be organized by systems and shall include the following information as a minimum:
  1. Title Page:
    - a. AABC certified company name
    - b. Company address
    - c. Company telephone number
    - d. Project identification number
    - e. Location
    - f. Project Architect
    - g. Project Engineer
    - h. Project Contractor
    - i. Project number
    - j. Date of report
    - k. AABC Certification Statement
    - l. Name, signature, and certification number of AABC TBE
  2. Table of Contents.
  3. AABC National Performance Guaranty.
  4. Report Summary:
    - a. The summary shall include a list of items that do not meet design tolerances, with information that may be considered in resolving deficiencies.
  5. Instrument List:
    - a. Type.
    - b. Manufacturer.
    - c. Model.
    - d. Serial Number.
    - e. Calibration Date.
  6. T&B Data:
    - a. Provide test data for specific systems and equipment as required by the most recent edition of the "AABC National Standards."

7. Print or sketch, reduced in size, showing all supply, return and exhaust air outlets for easy reference to report data.
- C. One copy of the final test and balance report shall be sent directly to the Mechanical Engineer of record. Provide five additional copies to the contractor.
- D. An approved copy of the balancing report shall be included in the maintenance manual submittal.

### 3.12 FINAL ACCEPTANCE

- A. At the time of final inspection, the T&B Agency shall recheck, in the presence of the Owner's Representative, specific and random selections of data and air quantities recorded in the Certified Report.
- B. Points and areas for recheck shall be selected by the Owner's Representative.
- C. Measurement and test procedures shall be the same as approved for work forming basis of Certified Report.
- D. Selections for recheck, specific plus random, will not normally exceed 25% of the total number tabulated in the report, except that special air systems may require a complete recheck for safety reasons.
- E. If random tests elicit a measured flow deviation of 10% or more from that recorded in the Certified Report listings, by 10% or more of the selected recheck stations, the report shall be automatically rejected. In the event the report is rejected, all systems shall be readjusted and tested, new data recorded, new Certified Report submitted, and new inspection tests made, all at no additional cost to the Owner.
- F. Following final acceptance of the Certified Report by the Owner's Representative the settings of all valves, splitters, dampers, and other adjustment devices shall be permanently marked by the T&B Agency, so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after final acceptance.

**END OF SECTION**

**SECTION 23 0900**  
**CONTROLS FOR HVAC**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes equipment and performance criteria for furnishing all labor and materials for the installation and programming for climate management control for HVAC systems, utilizing wireless communication with cloud-based servers.
- B. Related Sections
  - 1. Section 23 0500 – General Mechanical
  - 2. Section 23 0000 – Heating, Ventilating, Air-Conditioning
  - 3. Section 23 0593 – Testing, Adjusting and Balancing for HVAC
  - 4. Section 26 0500 – Basic Electrical Requirements
  - 5. Section 26 2700 – Basic Electrical Materials and Methods

**1.02 SCOPE OF WORK**

- A. Except where otherwise noted, the system shall consist of a network of commercial internet-programmable thermostats, their accessories, and any other networked climate management device(s) required to fill the intent of the Specifications, and a sequence of operations. A complete and operable system shall be provided.
- B. The Controls Contractor shall review and study existing building site conditions, where applicable, and all new construction Drawings for the project, including HVAC Drawings and the entire project Specifications, to familiarize themselves with the equipment and system operation prior to bidding and submittal of a bid/price. The Owner shall be notified immediately of any conflicts between the project and the scope of work of this Section, including work to be completed by others.
- C. All equipment and installation of control devices associated with the HVAC equipment indicated on the Drawings shall be provided by the Controls Contractor.
- D. When the energy management system is fully installed and operational, the Controls Contractor will make themselves available to meet with the designated representatives of the Owner to review the as-installed condition of the system. At that time, the Controls Contractor shall demonstrate the operation of the system and prove that it complies with the intent of the Drawings and Specifications.
- E. The Controls Contractor shall furnish and install a complete energy management control system, including all necessary hardware and all operating and applications software necessary to perform the control sequence of operations as called for.
- F. Provide and install energy management controls for the HVAC equipment as noted on the Drawings.
- G. Provide technical support necessary for commissioning of system in coordination with the HVAC Contractor, Balancing Contractor, and the Owner's team.
- H. The Controls Contractor shall provide one training session in the operation of the system for the Owner's personnel.
- I. All work performed under this Section shall be in compliance with all codes and regulations as mandated by the authority having jurisdiction.

### 1.03 CONTROL SYSTEM DESCRIPTIONS

- A. The energy management controls system shall be as indicated on the Drawings and described herein. System shall include a network of commercial internet-programmable thermostats, their accessories, and any other networked devices required for complete climate management. Devices shall communicate across a wireless network using IEEE 802.15.4 technical standards. Wireless communication shall be of an automated mesh communication type, which self-establishes network addresses, communication routes, and all other setup requirements to establish connection across the entire campus. A single ethernet-connected gateway shall be able to connect the wireless mesh network to the internet, allowing for climate management through a cloud-based web-application. This network design is to be used to isolate the controls system from the owner's private ethernet network (LAN) and/or WiFi networks. IEEE 802.11 or any other wireless standard of communication or a wired network communication protocol between devices is not acceptable by these energy management system specifications. The gateway is to connect to a single outbound ethernet connection on the owner's wide area network (WAN) over a TCP/IP connection. The owner's firewall shall not require any inbound port assignments for the gateway to connect to the cloud servers. The gateway shall not require a public IP and it shall not run any standard available operating systems, such as Windows or Linux.
- B. Access and control of the HVAC controls system shall be through a web-based graphical management platform. The controls platform shall sit on a cloud server and be accessible on both local personal computers and remotely by use of a web-browser that supports HTML5 or later.
- C. No on-site servers are to be installed or used for the controls system. No licensing fees or future licensing fees shall be required as part of the controls system. These Specifications and guidelines are to create a cohesive and secure network that provides full management over the facility's climate through the cloud controls system.
- D. The controls system shall accommodate an unlimited simultaneous multiple-user operation. Access to the controls system shall be limiting based on security permissions of each operator's role, managed by Owner site administrators.

### 1.04 APPROVED CONTROL SYSTEM MANUFACTURERS

- A. Pelican Wireless Systems

### 1.05 SUBMITTALS

- A. Shop drawings and product data in accordance with Division 01 Sections, the General Conditions, Supplemental Conditions, and the following.
  - 1. Shop drawings and manufacturer's standard product specification data sheets on all hardware and software products shall be provided for this project. No work may begin on any segment of this project until the Architect has reviewed submittals for conformity with the plan and specifications.
  - 2. All submittals shall be bound in a three-ring binder or provided digitally on a USB stick, with a table of contents and related section tabs. Five (5) copies shall be submitted to the Architect for distribution and review.
  - 3. Shop drawings shall be prepared in Auto CAD 2014 or newer and shall include basic floor plans depicting locations of all equipment and wiring (installed by others) to be controlled by system and locations of thermostats, gateways, and other equipment provided under this Section. Drawings shall also show location of electrical power, low voltage wiring, and data ports, which are provided by others, and required for proper installation of systems of this Section.

4. Submit submittal data and shop drawings to the Architect for review prior to ordering or fabrication of the equipment. The Contractor, prior to submitting, shall check all documents for accuracy.
5. The Architect will note corrections, if required, and return to the Contractor. The Contractor will then resubmit with the corrected or additional data. This procedure shall be repeated until all corrections are made to the satisfaction of the Architect and the submittals are fully approved.

#### **1.06 CODES AND STANDARDS**

- A. Codes and Standards. Meet requirements of all applicable standards and codes, except when more detailed or stringent requirements are indicated by the Contract Documents, including requirements of this Section.
  1. California 2022 Title 24 Compliant
  2. California Energy Commission Occupant Control Smart Thermostat (OCST) certified
  3. Open ADR 2.0 certified
- B. All wiring shall conform to the National Electrical Code.

#### **1.07 TRAINING**

- A. The Controls Contractor shall provide training for 2 owner representatives and/or maintenance personnel. The Controls Contractor shall provide on-site training to the District's representative(s) and maintenance personnel per the following description:
  1. On-site training shall consist of a minimum of 1 hour of hands-on instruction geared at the operation and maintenance of the systems. The curriculum shall include:
    - a. System overview
    - b. System application and operation
    - c. System access
    - d. Application features overview
    - e. Changing set points and other attributes
    - f. Scheduling
    - g. Editing configurable and programmed variables
    - h. Displaying color graphics
    - i. Viewing historical reports
    - j. Operational sequences including start-up, shutdown, adjusting, and balancing
    - k. Equipment maintenance

#### **1.08 OPERATING AND MAINTENANCE MANUALS**

- A. The operation and maintenance manuals shall contain all information necessary for the operation, maintenance, replacement, installation, and parts procurement for the entire BAS.
- B. Following project completion and testing, the Controls Contractor shall submit as-built documentation reflecting the exact installation of the system.

#### **1.09 WARRANTY**

- A. The Controls Contractor shall warrant the system for 12 months after system acceptance and beneficial use by the Owner. During the warranty period, the Controls Contractor shall be responsible for all necessary revisions required to provide a complete and workable system, consistent with the letter and intent of the sequence of operations. HVAC controls equipment shall include a limited warranty by the manufacturer for a period of 5 years from the time of system acceptance.
- B. Limited warranty by manufacturer is limited to replacement of defective products.

### **1.10 WORK BY OTHERS**

- A. The Controls Contractor shall coordinate with other Contractors prior to performing the work on this project and cooperate as necessary to achieve a complete and neat installation. To that end, each Contractor shall consult the Drawings and Specifications for all trades to determine the nature and extent of others' work prior to fabrication and installation. The Owner's Representative shall be immediately notified if an area of conflict occurs between trades prior to fabrication and installation. Controls Contractor shall provide field supervision to the Mechanical Contractor for pre-installation of control components.
- B. Low-voltage thermostat wiring between equipment and thermostat locations shall be furnished and installed by others. Unless otherwise noted, all new low-voltage wiring shall be multiple conductor thermostat wiring (wire count as indicated in thermostat manufacturer's installation instructions) installed per Owner's specifications. (Wiring in existing installations shall be minimum 3 conductor/18-gauge wires, per controls manufacturer's standard specifications, multiple conductor/18-gauge thermostat wiring preferred. See installation instructions for specific conductor counts depending on heating and cooling modes of existing equipment.)
- C. Related work provided by others:
  - 1. 110V outlets shall be provided within 5 feet of each gateway or wireless repeater location.
  - 2. 1 ethernet data port shall be provided within 10 feet of each gateway location.
- D. Equipment start-up and servicing.

## **PART 2 PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Unless otherwise noted, all products shall be of a single manufacturer. The standard of design and quality shall be products manufactured by Pelican Wireless Systems.

### **2.02 COMMUNICATION**

- A. This project shall be comprised of a network of devices that use an IEEE 802.15.4 self-creating and self-healing wireless mesh communication network to reach an ethernet gateway.
- B. The gateway shall communicate to cloud servers via a single ethernet connection at the Owner's wide area network (WAN) over a TCP/IP connection. The facility's firewall shall not require any inbound port assignments for the gateway to connect to the cloud servers. The gateway shall not require a public IP.
- C. No BACnet, ModBus, LON, or any other device-to-device wired communication protocol shall be used in the communication network.

### **2.03 OPERATOR INTERFACE**

- A. The controls system shall be controlled, managed, and configured using a web-app on any personal computer, smartphone, and/or tablet that runs a browser with HTML5 or newer.
- B. The web-app platform shall run on cloud servers that allow for virtual access. The platform shall not run on a local on-site server.
- C. The web-app shall support, at a minimum, the following functions:
  - 1. Personal user log-on identifications (email addresses) and unique passwords shall be required.

2. Custom HTML programming shall not be required to display any graphics, data, or build the web-app. There shall be no development cost, commissioning costs, or software upgrade cost required to obtain and use the web-app.
  3. Storage of historical data shall reside on the cloud server and shall not sit within the client's computer, internal network, or other devices. A controls system that requires on-site data storage is not acceptable.
  4. System shall allow for administrator and user defined access privileges.
  5. A push/pull open API interface with XML data output shall be available.
  6. Servers shall not run a Windows operating system.
- D. Control and Override
1. The controls system shall provide view, override, and edit of the status of any object and property in the system. The status of the device shall be defined graphically and shall not require any custom programs or programming.
  2. Temporary Overrides. The controls system shall be able to provide temporary override (wherever an override is allowed) and automatically remove the override after a specified period.
  3. Any override and edit of an object virtually or at the device, if allowable, shall be historically tracked.
- E. Scheduling
1. The controls system shall provide users with scheduling of application devices through a graphical interface. Scheduling shall include, but is not limited to:
    - a. Occupied/Unoccupied Schedules. Shall allow 12 scheduled set-time changes in a single day, be configurable for daily, weekly, and weekday/weekend layouts, and shall be able to be unique to individual devices or easily shared between multiple devices, where applicable.
    - b. Event Schedules. Shall allow for advanced one-time or repeating event type schedules. Event schedules shall override occupied/unoccupied schedules. After the event schedule ends, the device shall revert to the occupied / unoccupied schedule automatically.
    - c. Vacation Schedules. A 360-day calendar shall provide override of schedules during vacation days. Thermostats shall be able to automatically or be manually switched to follow vacation schedules instead of occupied/unoccupied schedules.
- F. Alarm Notification
1. Alarm notification(s) shall be generated if there are failures detected by devices part of the .. These failures shall be, but are not limited to temperature deviations, temperatures missing targets, temperatures too high or too low, failures of equipment, etc. Alarm notification(s) shall be posted on the controls system and shall be able to be sent either via email or text message to an unlimited number of users.
- G. Reports and Logs
1. Data shall be logged and stored on cloud servers for all devices that are part of the controls system, in real-time. Every device real-time "state change", when applicable, shall be stored and viewable for at least 1 week, with the option of up to 2 years.
    - a. Each space temperature
    - b. Each temperature set point(s)
    - c. Each current call: heat, cool, number of stages, fan, economizer, etc.
    - d. Each damper position
    - e. Each valve position
    - f. Each CO<sup>2</sup> change
    - g. Each CO<sup>2</sup> setting
    - h. Each current call for ventilation due to high CO<sup>2</sup>

- i. Each humidity change
  - j. Each humidity set point
  - k. Each current call for dehumidification or humidification.
  - l. Each fan speed adjustment
  - m. Supply duct static pressure
  - n. Supply, return, outside air temperatures
2. Data shall be represented on historical graphs that allow for easy viewing of device state change at different times.
  3. Excel outputs shall not be required to view data. Historical data shall be viewable through the controls system.

#### 2.04 APPLICATION-SPECIFIC CONTROLLERS

- A. Application specific controllers shall not require custom programming and shall control specific equipment through simple configuration settings done through the cloud-based controls system. All configuration changes shall automatically upload into the device once set on the controls system and shall be stored by the device's internal memory.
- B. Gateways are devices that connect to an ethernet port and act as a bridge between the controls system cloud servers and the wireless mesh network.
  1. Shall be capable of providing internet connection to up to 2,000 devices.
  2. Shall be capable of automatically addressing routing tables to all devices part of wireless mesh network and shall not require manual programming or addressing.
  3. Shall communicate to cloud servers over a TCP/IP outbound-only connection.
  4. Shall not require a public IP address, custom VPNs, or any on-site servers.
  5. Shall communicate to other controls system devices over the dedicated and isolated 802.15.4 IEEE technical standard.
  6. Shall be secured using AES (Advanced Encryption Standards).
- C. Internet-enabled thermostats are controllers that detect a space/zone temperature and operate equipment or dampers that supply heating, cooling, ventilation, or a combination of the 3 mechanical states, to their space/zone. Examples are thermostats for VAV, VVT, fan-powered boxes, fan coil, blower coils, unit ventilators, heat pumps, water source heat pumps, and conventional DX and/or gas heat equipment.
- D. Pelican thermostat TC1, thermostat only, or TC3, thermostat and carbon dioxide sensor, shall be provided on all school projects. Provide with clear plastic thermostat lockbox cover. Honeywell Home or equal.
- E. Internet-enabled thermostats:
  1. Shall be capable of providing 24VAC outputs that can be configured to provide control of the following: 2 stages of fan, 3 stages of cooling, 2 stages of heating, 1 stage of auxiliary heat (heat pumps), floating point zone dampers, 2-position zone dampers, floating point zone reheat valves, and 2-position zone reheat valves.
  2. Shall include a removable wiring terminal module that allows for thermostat installation, even in situations where there are only 3 wires between equipment and where the thermostat is to be installed.
  3. Shall be available with the following internal sensors: temperature only, temperature and humidity, temperature, humidity, CO<sup>2</sup>, and temperature and CO<sup>2</sup>. All sensors required by the Specifications are to be internal to the thermostat and not require 2 devices on the wall.
  4. Shall be able to accept expansion accessories that allow for more advanced control sequences and additional temperature detection. Examples are economizer controllers, outside air ventilation control, supply air temperature detection, unit ventilator



- face/bypass control, and modulating control. All expansion accessories shall be internet enabled and accessible through controls system.
5. Shall communicate with the wireless mesh network through an internal wireless antenna that runs on the 802.15.4 technical standards.
  6. Shall be able to automatically repeat the wireless mesh network to additional devices part of the controls system.
  7. Shall automatically push, in real-time, to the controls system all "state changes" so as to be viewable historically and in real-time from the controls system. Examples are changes in equipment operation (heat, cool, fan), number of stages active, the temperatures in the space, damper position, valve position, temperature set-points, etc.
  8. Shall be able to lock-out heat pump compressor(s) based on outside air temperature.
  9. Shall provide set-point (heat & cool) temperature limitations through the controls system.
  10. Shall provide full local keypad lock-out from the controls system.
  11. Shall meet California 2019 Title 24 code standards.
  12. Shall have a programmable 3° F heat/cool temperature range that auto-adjusts to a 5° F dead band.
  13. Shall have both a heat setpoint, cool setpoint, and auto-changeover.
  14. Shall have optimum start algorithms that will calculate start times based on at least 7 days of previous run-time temperature and rate-of-change historical data for its space. Optimum start algorithm shall recalculate each optimized schedule time before each optimized schedule.
  15. Shall be able to be manually overridden through the controls system.
  16. Shall be configured through the controls system.
- F. Wired temperature inputs are to be available to provide external temperature detection for specific controls system devices. Examples are to provide supply air temperature, water temperature, refrigeration temperature, outside air temperature, etc. to a thermostat or other device.
1. Shall accept 10K type II thermistors.
  2. Shall push to the controls system real-time temperature changes so as to be viewable historically and in real-time from the controls system.
  3. Shall accept a thermistor at a maximum of up to 100 feet from input terminal.
  4. Shall be configured through the controls system.
- G. Internet-enabled economizer controller are controllers that modulate an outside air damper to provide ventilation and economization to a single zone.
1. Shall only require a dry-bulb outside air temperature sensor and dry-bulb supply air temperature sensor. No dry-bulb return air temperature sensor or dry-bulb mixing box temperature sensor shall be required to meet full economizer functionality to at a minimum California 2019 Title 24 standards.
  2. Shall communicate with thermostat to determine space temperature and space temperature setpoint, in order to decide when economization can be used.
  3. Shall continue to economize as its only source of cooling as long as the outside air temperature is able to keep the space temperature within 1°F of the cool temperature setpoint.
  4. Shall be able to enable mechanical cooling at the same time as economization.
  5. Shall be able to prevent the supply air temperature from dropping below a minimum temperature.
  6. Shall provide enthalpy by use of pulling humidity and barometric pressure information from the internet, based on the zip code of installation location. Enthalpy shall not require any additional probes other than the dry-bulb probe and shall be free to enable.
  7. If connected to a CO<sup>2</sup> thermostat, shall be able to provide demand ventilation control of outside air damper.

8. Shall have a minimum ventilation damper position and a maximum ventilation damper position.
  9. Shall be able to be scheduled to not open the outside air damper for ventilation during unoccupied hours.
  10. Shall be able to control a variable frequency drive (VFD) with up to 5 fan speed inputs. Example of fan speed changes are during ventilation, stage 1 cooling, stage 2 cooling, stage 1 heating, stage 2 heating.
  11. Shall modulate an outside air damper by use of a 0-10VDC signal.
  12. Shall accept a 0-10VDC signal feedback input from the outside air damper actuator to confirm outside air damper is working correctly.
  13. Shall meet all California 2019 Title 24 codes, including fault detection and diagnostic requirements.
  14. Shall send fault detection and diagnostic information to the controls system.
  15. Shall accept a minimum of three 10K type II thermistors.
  16. Shall be able to modulate a 0-10VDC hot water, steam, or electric SCR for heating and outside air tempering.
  17. Shall be able to modulate a 0-10VDC chilled water or modulating DX for cooling and outside air tempering.
  18. Shall be able to control a face/bypass damper.
  19. Shall push all "state changes" to the controls system as to be viewable historically and in real-time from controls system. Examples are changes in equipment operation (heat, cool, fan, economization, ventilation), number of stages active, the supply air temperature, the return air temperature, hot water valve position, face/bypass damper position, variable speed fan setting, etc.
  20. Shall be able to be manually overridden through the controls system.
  21. Shall be configured through the controls system.
- H. Internet-enabled power relay modules are controllers that have dry-contact relays able to start/stop different electrical equipment. Examples are exhaust fans, lights, pumps, valves, boilers, chillers, etc.
1. Shall have relays with a max rating of 120 VAC @ 15 AMPs or 240/277 VAC @ 10 AMPs.
  2. Shall have a low-voltage terminal for momentary contact override inputs. Override time shall be configurable for a specific amount of minutes through a configuration from the controls system.
  3. Shall be able to provide lead/lag sequencing between relays.
  4. Shall be able to accept an external dry-contact input used to verify flow, if being used as a pump controller. If being used as a lead/lag pump controller, shall be able to alarm the C if flow is not detected when Pump A is enabled and start Pump B as a stand-by pump.
  5. Shall communicate with the wireless mesh network through an external wireless antenna that runs on the 802.15.4 technical standards. Antenna shall be able to communicate with power relay module over (3) 18-gauge wires up to 500 feet between device terminal inputs.
  6. Shall be able to automatically repeat the wireless mesh network to additional devices part of the controls system.
  7. Shall push all "state changes" to the controls system as to be viewable historically and in real-time from the controls system. Examples are changes in relay positions On or Off.
  8. Shall be able to be manually overridden through the controls system.
  9. Shall be configured through the controls system.
- I. Zone controllers are controllers that operate equipment that supplies heating, cooling and ventilation, or a combination of these mechanical states, to multiple zones.
1. Shall communicate with the wireless mesh network through a removable wireless antenna that runs on the 802.15.4 technical standards.

2. Remote mountable antenna shall be able to communicate to zone controller over (3) 18-gauge wires up to 500 feet between devices terminal inputs.
  3. Communication from the zone controller to all zone/space thermostats shall be over the wireless mesh network.
  4. Shall be capable of providing 24VAC outputs that can be configured to provide control of the following: multiple stages of fan, multiple stages of cooling, and multiple stages of heating.
  5. Shall be capable of providing 0-10VDC outputs that can be configured to provide control of the following: variable speed fan (VFD), modulating outside air damper, modulating heating valve.
  6. Shall have integrated outside air damper control logic and not require third-party or additional controllers to provide economization and ventilation control.
  7. Shall directly accept a supply duct static pressure probe. Shall have an integrated short-term and long-term learning PID loop algorithm for maintaining target supply static configurations. PID loop shall not require any type of cost for programming and is to be factory loaded into controller.
  8. Shall only require dry-bulb outside, return, and supply air temperature sensors.
  9. If communicating to CO<sup>2</sup> thermostat(s), shall be able to provide demand ventilation control of outside air damper.
  10. Shall push all "state changes" to the controls system as to be viewable historically and in real-time from the BAS. Examples are changes in equipment operation (heat, cool, fan, economization, ventilation), number of stages active, the supply air temperature, the return air temperature, the outside air temperature, hot water valve position, supply duct static reading, variable speed fan setting, etc.
  11. Shall be able to be manually overridden through the controls system.
  12. Shall be configured through the controls system.
- J. Make-up air controllers that operate equipment supplying ventilation to the building.
1. Shall communicate with the wireless mesh network through a removable wireless antenna that runs on the 802.15.4 technical standards.
  2. Remote mountable antenna shall be able to communicate to controller over (3) 18-gauge wires up to 500 feet between devices terminal inputs.
  3. Communication from the controller to zone/space thermostat(s) shall be over the wireless mesh network.
  4. Shall be capable of providing 24VAC outputs that can be configured to provide control of the following: multiple stages of fan, multiple stages of cooling, and multiple stages of heating.
  5. Shall be capable of providing 0-10VDC outputs that can be configured to provide control of the following: modulating variable speed fan (VFD), modulating outside air damper, modulating heating, modulating cooling.
  6. Shall be able to modulate a VFD to maintain a targeted building static pressure.
  7. Shall be able to modulate a 0-10VDC hot water, steam, or electric SCR for heating and outside air tempering.
  8. Shall be able to modulate a 0-10VDC chilled water or modulating DX for cooling and outside air tempering.
  9. Shall have integrated outside air damper control logic.
  10. Shall directly accept a building pressure probe. Shall have an integrated short-term and long-term learning PID loop algorithm for maintaining target building pressure. PID loop shall not require any type of cost for programming and is to be factory loaded into controller and updatable virtually through EMS.
  11. Shall only require dry-bulb outside and supply air temperature sensors.

12. If communicating to CO<sup>2</sup> thermostat(s), shall be able to provide demand ventilation control of outside air damper.
  13. Shall push all "state changes" to the controls system as to be viewable historically and in real-time from the controls system. Examples are changes in equipment operation (heat, cool, fan, economization, ventilation), number of stages active, the supply air temperature, the return air temperature, the outside air temperature, hot water valve position, supply duct static reading, variable speed fan setting, etc.
  14. Shall be scheduled On or Off through the controls system.
  15. Shall be able to be manually overridden through the controls system.
  16. Shall be configured through the controls system.
- K. Wireless proximity sensors are thermostat accessories that can detect when a door or window is opened or closed or be able to accept a dry-contact input from an occupancy sensor.
1. Shall be able to communicate to a single internet-programmable thermostat over wireless mesh network.
  2. Shall communicate with the wireless mesh network through an internal wireless antenna that runs on the 802.15.4 technical standards.
  3. Shall run on two AA batteries and not require any unique type of battery to operate.
  4. Shall push all "state changes" to the controls system as to be viewable historically and in real-time from the controls system. Examples are if the door is open, if the space is unoccupied, if a window is open.
  5. Shall be configured through the controls system.
- L. Remote wireless sensors are thermostat accessories that are used to either average temperatures between the sensor's location and a master thermostat or to relocate the sensing location of the master thermostat without having to run new wire.
1. Shall be able to communicate to a single internet-programmable thermostat over wireless mesh network.
  2. Shall communicate with the wireless mesh network through an internal wireless antenna that runs on the 802.15.4 technical standards.
  3. Shall run on two AA batteries and not require any unique type of battery to operate.
  4. Shall push all "state changes" to the BAS as to be viewable historically and in real-time from the BAS. Examples are changes in equipment operation (heat, cool, fan), number of stages active, the temperatures in the space, temperature set-points, etc.
  5. Shall be configured through the controls system.
- M. Wireless repeaters are devices that extend the 802.15.4 wireless mesh network across large expanses or where controls system devices are unable to repeat the wireless mesh network on their own. Examples are when bridging the wireless mesh network from one building to another.
1. Shall communicate with the wireless mesh network through an internal wireless antenna that runs on the 802.15.4 technical standards.
  2. Shall be able to automatically repeat the wireless mesh network to additional devices part of the controls system.
  3. Shall not require an ethernet connection or any TCP/IP connection.
  4. Shall only require a single 120V outlet for power.
- N. Configuration of devices and system
1. To meet the sequence of operations for each controller, the controller shall be configured through the controls system by the installing Contractor. No custom programming or downloading by use of a service tool shall be required.
  2. Stand-alone operation: Each piece of equipment specified shall provide stand-alone operation. Controls system devices shall not require web connection or communication to the BAS to run under normal operations.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. The Contract Documents shall be thoroughly examined for coordination of control devices, their installation, wiring, and commissioning. Coordinate and review mechanical equipment specifications, locations, and identify any discrepancies, conflicts, or omissions that shall be reported to the Architect for resolution before rough-in work is started.
- B. The controls system manufacturer shall be available to help the Controls Contractor in order to verify that control equipment can be installed as required, and any discrepancies, conflicts, or omissions shall be reported to the Architect for resolution before rough-in work is started.

#### **3.02 PROTECTION**

- A. The Controls Contractor shall protect all work and material from damage by their work or personnel and shall be liable for all damage thus caused.
- B. The BAS installing Contractor shall be responsible for their work and equipment until final inspection, testing, and acceptance. The Controls Contractor shall protect their work against theft or damage and shall carefully store material and equipment received on site that is not immediately installed. The Contractor shall close all open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.
- C. Installation of controls system shall be performed by an approved Contractor. Approved Contractor is one whom either has installed the controls system before or has been approved by the controls system manufacturer. The Contractor shall certify all work as proper and complete. Under no circumstance shall the design, scheduling, coordination, programming, training, and warranty requirements for the project be delegated to a subcontractor unless that Subcontractor meets the controls system approved Contractor requirements as stated above.
- D. Demolition. Remove controls that do not remain as part of the controls system. The Owner shall inform the Contractor of any equipment that is to be removed that will remain the property of the Owner. All other equipment that is removed will be disposed of by the Contractor.
- E. Access to site. Unless notified otherwise, entrance to building is restricted. No one will be permitted to enter the building unless their names have been cleared with the Owner or an Owner-approved representative.
- F. Code compliance. All wiring shall be installed in accordance with all applicable electrical codes and shall comply with equipment manufacturer's recommendations.
- G. Clean up. During installation, Contractor shall maintain a clean environment. At the completion of the work, all equipment pertinent to this contract shall be checked and thoroughly cleaned, and all other areas shall be cleaned around equipment provided under this Contract.

#### **3.03 TEST AND BALANCE**

- A. Testing of controls shall be performed by installing Contractor. All equipment and components being controlled shall be tested, including, but not limited to: heating enables and a proper supply air temperature from the AHU, RTU, and into the zone (if there is a zone box) is recorded, cooling enables and a proper supply air temperature from the AHU, RTU, and into the zone (if there is a zone box) is recorded, fan enables and the proper fan speed is set when specified (when using a multiple speed fan, VFD, or ECM motor), and that the outside air

damper fully opens and closes when commanded. Any devices that are enabled and disabled shall properly respond to the controls system control signals.

- B. All control configurations shall be set to meet specifications. All temperatures and other sensors shall be determined accurate and configured for the type of temperature being detected.
- C. All mechanical systems controlled by the controls system shall be properly balanced to the right CFMs to meet required codes and specifications.

### 3.04 WIRING, CONDUIT, AND CABLE

- A. All control wires between mechanical equipment and control system devices are to be furnished and installed by others, unless Controls Contractor is responsible for this part of the installation. The Controls Contractor shall not begin work on this contract until all wiring is installed to the satisfaction of the Controls Contractor.
- B. It is not an excuse to have not referenced the manufacturer's installation documentation or to have contacted the controls system manufacturer if wire installation is not understood and done incorrectly by the installing Contractor.

### 3.05 HARDWARE INSTALLATION

- A. Installation practices for devices. All devices are to be mounted level/plumb and per the manufacturer's installation documentation.
- B. It is not an excuse to have not referenced the manufacturer's installation documentation or to have contacted the controls system manufacturer if hardware installation not understood and done incorrectly by the installing Contractor.
- C. Identification.
  - 1. Identify all control wires with labeling tape or sleeves using either words, letters, or numbers that can be exactly cross-referenced with as-built drawings.
  - 2. All field enclosures, other than controllers, shall be identified with a nameplate. The lettering shall be in white against a black or blue background.
  - 3. Junction box covers will be marked to indicate that they are a part of the controls system.
  - 4. All field devices (except space sensors) that are not mounted within FIP's shall be identified with name plates.
  - 5. All field devices inside FIP's shall be labeled.
- D. Existing controls. Existing controls are not to be reused. All controls system devices will be new.
- E. Control system switch-over. The Controls Contractor shall minimize control system downtime during switch-over. Sufficient installation mechanics shall be on-site so that the entire switch-over can be accomplished within a reasonable time frame.
- F. Location.
  - 1. The location of sensors is as indicated in the mechanical and architectural Drawings.
  - 2. Space temperature, humidity, and CO<sup>2</sup> sensors will be mounted away from machinery generating heat, direct light, and/or diffuser air streams.
  - 3. If external temperature sensors are installed, sensors will be mounted away from machinery generating heat, direct light, and/or diffuser air streams.
  - 4. If outdoor air temperature sensors are installed, sensors are to be installed such that the effects of heat radiated from the building or sunlight is minimized.

### 3.06 SYSTEM CONFIGURATION

- A. General. The installing Contractor shall provide all labor necessary to install, initialize, start-up and troubleshoot all system hardware and configurations described in this Section. This includes any requirements necessary to access the web application on third-party devices.
- B. Installing Contractor shall work with Owner's representative to determine configuration parameters including but not limited to, hours of operation, set points, system variables, naming of devices, and site naming. Naming of devices and the site shall be performed by the installing Contractor. Naming convention of space thermostats shall be space served. Naming convention of zone controllers shall be the equipment serial number. All naming shall be provided by or agreed upon with the Owner.

### 3.07 SYSTEM COMMISSIONING AND SYSTEM STARTUP

- A. Each controls system component shall be tested for both hardware and software functionality. In addition, each mechanical and electrical system under control of the controls system shall be tested against the appropriate sequence of operations. Documentation shall be provided to the Owner that proves installation and testing has been completed and points out any mechanical issues found that are not related to the installation of the controls system. Successful completion of the system tests shall constitute the beginning of the warranty period.
- B. The Controls Contractor shall provide all manpower and engineering services required to assist the HVAC Contractor and Balancing Contractor in testing, adjusting, and balancing all systems in the building. The Controls Contractor shall have a trained technician available on request during the balancing of the systems. The Controls Contractor shall coordinate all requirements to provide a complete air balance with the Balancing Contractor and shall include all labor and materials in his contract to assist with functional testing of system as it relates to the controls system.
- C. Upon completion of installation, submit copies of record documents. The documents shall be submitted for approval prior to final completion and include:
  - 1. Testing and commissioning reports and checklists signed off by trained field commissioning personnel.
  - 2. Name, address, and telephone number of Contractor personnel managing and installing equipment, along with service personnel responsible for supporting the ongoing warranty and services of the control system.
  - 3. Procedures for operating the controls system including logging on/off, alarm management, reading reports, trends, modification of setpoints, scheduling, and other interactive system requirements.
  - 4. Information on how to receive support from Pelican Wireless Systems and demonstrate that they are a direct supporting resource. Contact information for Technical Support from Pelican Wireless Systems is to be provided.

**END OF SECTION**

**SECTION 26 0500**  
**BASIC ELECTRICAL REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 WORK INCLUDED**

- A. Work included in this Section: All materials, labor, equipment, services, and incidentals necessary to provide and install the Electrical Work as shown on the drawings and as specified hereinafter, including, but not limited to the following:
1. Distribution panels, panels, circuit breakers, and feeders.
  2. Branch circuit wiring, wiring devices and connections to all equipment requiring electrical service.
  3. Exit illumination system.
  4. Fire Alarm system.
  5. Mechanical equipment power connections, and motor starters.
  6. All required incidental work, such as roof flashing, electrical testing, title 24 acceptance testing, and temporary power.
  7. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the the drawings.
  8. It is the intent of the drawings and specifications that systems be complete and, except as otherwise noted, be ready for operation.

**1.02 RELATED WORK**

- A. Division 1 - General Requirements
- B. Division 9 - Finishes
- C. Division 23 - Mechanical

**1.03 INCORPORATED DOCUMENTS**

- A. Requirements of the General Conditions, Supplementary Conditions, and Division 1 Sections apply to all work in this Section, unless modified herein.
- B. Published specifications, standard tests or recommended methods of trade, industry or government organizations apply to work of this Section where cited by abbreviations noted below, unless modified herein.
1. 2022 California Code of Regulations.
  2. 2022 California Building Standards Administrative Code, Part 1, Title 24, C.C.R.
  3. 2022 California Building Code (CBC), Part 2, Title 24, C.C.R. (Based on 2021 International Building Code with 2022 California Amendments).
  4. 2022 California Electrical Code (CEC), Part 3, Title 24, C.C.R. (Based on 2017 National Electrical Code with 2022 California Amendments).
  5. California Energy Code, Part 6, Title 24, C.C.R.
  6. 2022 California Fire Code (CFC), Part 9, Title 24, C.C.R. (Based on 2021 International Fire Code with 2022 California Amendments).
  7. 2022 California Green Building Standards (CALGreen) Code, Part 11.
  8. American Society of Civil Engineers 7-16 (ASCE/SEI), Minimum Design Loads for Buildings and Other Structures.
  9. Underwriters' Laboratories, Inc. (UL).



10. Local Utility Company regulations.

C. All State and Municipal Codes and Ordinances.

#### **1.04 CONDITIONS AT SITE:**

- A. Visit to site is required of all bidders prior to submission of bid. All will be held to have familiarized themselves with all discernible conditions and no extra payment will be allowed for work required because of these conditions, whether specifically mentioned or not.
- B. Lines of other services that are damaged as a result of this work shall promptly be repaired at no expense to the Owner to the complete satisfaction of the Owner.

#### **1.05 QUALITY ASSURANCE**

- A. Conformance:
  - 1. All work shall conform to the applicable requirements of Article 1.3 above.
  - 2. The Contractor shall notify the Architect, prior to submission of bid, about any part of the design, which fails to comply with abovementioned requirements.
  - 3. If after contract is awarded, minor changes and additions are required by aforementioned authorities, even though such work is not shown on the drawings or covered in the specifications, they shall be included at Contractor's expense.
- B. Coordination:
  - 1. The Contractor shall become familiar with the conditions at the job site, and with the drawings and specifications and plan the installation of the electrical work to conform with the existing conditions and that shown and specified so as to provide the best possible assembly of the combined work of all trades.
  - 2. The Contractor shall work out in advance all "tight" conditions, involving all trades and if found necessary, supplementary drawings shall be prepared by this Contractor, for the Architect's approval, before work proceeds in these areas. No additional costs will be considered for work, which must be relocated due to conflicts with the work of other trades.
  - 3. The Contractor shall coordinate and verify all backbox, device, lighting fixture, or equipment mounting requirements with the devices or equipment to be installed, prior to rough in.

#### **1.06 SUBMITTALS**

- A. Product Data:
  - 1. Comply with the provisions of Section 01 33 00 - Submittals.
  - 2. Within 15 days after award of the Contract, submit:
    - a. Complete electrical, lighting, and signal systems material list of all items proposed to be furnished and installed under this Division. Provide manufacturers data sheets for all devices, raceways, fixtures, equipment, and related products to be used for the Division 26, 27, and 28 work.
    - b. Manufacturers' specifications and other data required demonstrating compliance with the specified requirements.
    - c. Manufacturers' recommended installation procedures which, when approved by the Architect, shall become the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

3. Test Reports:
  - a. Factory Tests: As specified for specific equipment.
  - b. Field Tests: Performance tests as specified for specific equipment.
  - c. Megger Tests: As specified under TESTING.
  - d. When series rated circuit breakers are used, provide a letter from the manufacturer of the equipment confirming that U.L. series rating exists for all protective devices. State the available fault current from the Utility Company and indicate that the overcurrent devices exceed the available fault current at the respective point of protection.
  - e. Special Seismic Certification documentation as per CBC Section 1616A and ASCE/SEI 7-16 requirements for all equipment defined as 'critical' with an importance factor of 1.5 in Paragraph 1.10.M.3 of this Section.
  - f. Manufacturer's Seismic Certification or Project-Specific Design of Supports and Attachments for all other equipment and fixtures as per CBC Section 1616A and ASCE/SEI 7-16 requirements.
4. Maintenance and Operating Manuals:
  - a. Systems Description: Description of operating procedures.
  - b. Controls: Diagrams and description of operation of each system.
  - c. Equipment: Manufacturer's brochures, ratings, certified shop drawings, maintenance data, and parts lists with part numbers. Mark each sheet with equipment identification number and actual installed condition.
  - d. Materials and Accessories: Manufacturer's brochures, parts lists with part numbers, and maintenance data where applicable. Mark each sheet with identification number of system and location of installation.
  - e. The Maintenance and Operation Manual shall be presented in a bookmarked PDF file with tabbed sections as stated below. Provide all information in each section as stated below.
    - 1) 26 2400:
      - (a) Insert the approved submittals for the main switchboard and panelboards, and for medium voltage switchgear and transformers if specified herein and/or indicated on the drawings.
      - (b) Provide the names, addresses and telephone numbers of the manufacturer and the two closest manufacturer's representatives of the equipment.
    - 2) 28 3100:
      - (a) Complete the "Record Of Completion" entirely.
      - (b) In the "Download File" indicate the exact equipment that the Monitor Modules are monitoring. i.e. fire sprinkler flow switches, tamper switches, etc..
      - (c) Simplify the Download File so that it coincides with the submitted and approved fire alarm single line diagram.
      - (d) Provide the names, address and telephone number of the manufacturer and the closest manufacturer's representative of the equipment.
      - (e) Include the manufacturer's recommended maintenance of the equipment.

- (f) Insert an abbreviated data sheet that states how to test, reset and silence the fire alarm system.
  - (g) Insert the name and telephone number of the Central Station that receives the alarms, and the proper sequence to follow during an alarm.
- 3) 26 0800:
- (a) Insert all systems testing results.
5. Record Documents: "As-builts": As specified under Paragraph 3.2 of this Section.

### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all trades.
- B. Delivery and Storage: Deliver all materials to the job site in their original containers with all labels intact and legible at time of use. Store in strict accordance with approved manufacturers' recommendations.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.
- D. This Contractor shall personally, or through an authorized representative, check all materials upon receipt at jobsite for conformance with approved shop drawings and/or plans and specifications.

### **1.08 SCHEDULING/SEQUENCING**

- A. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. If any materials or equipment are not ordered in time, additional charges made by equipment manufacturers to complete their equipment in time to meet the construction schedule, together with any special handling charges, shall be borne by this Contractor.
- B. The Contractor shall coordinate production and delivery schedule for all Owner-supplied equipment with the equipment suppliers to ensure that all Owner-supplied equipment is delivered to site in coordination with the construction schedule and in such a manner as to cause no delays in completion of the Contract as scheduled.

### **1.09 REQUIREMENTS**

- A. The contract drawings indicate the extent and general arrangements of the conduit wiring systems, etc. If any departures from the contract drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted as soon as practicable, and within thirty-five (35) days after award of the electrical contract.
- B. Unless material list and data is received as a complete and all-inclusive submittal within the stipulated time all items shall be provided as specified, with no deviations permitted.
- C. Any and all additional costs incurred by the substitution of electrical material or equipment, or installation thereof, whether architectural, structural, plumbing, mechanical or electrical, shall be borne by the Contractor under this Section.

- D. Burden of proof of equality of any substitution for a specified product is the responsibility of this Contractor.
- E. Where required by Architect to ascertain equality of substitute product, Contractor may be requested to provide the specified item and the submitted substitution for comparison, at no additional cost to the Owner.

#### **1.10 DESCRIPTION OF DEMOLITION AND REPLACEMENT WORK**

- A. This project includes the demolition and replacement of all existing HVAC equipment in Building A. As such, the project scope for this contractor shall include all associated electrical, lighting, and signal system upgrades and demolition/removal work at the existing buildings(s) and/or site. The intent is that all systems will be complete and functional at the completion of this contract and that all old systems, equipment, feeders, circuits, wiring, and related devices (no longer used) be completely and neatly removed. Where discrepancies between the drawings and existing conditions are noted, the Architect or Owner shall be notified immediately for resolution.
- B. As with every renovation project, the electrical work will include (and require) exploration and other field work on a daily basis to complete the new designed equipment and connections within the constraints of the existing building and existing site conditions.
- C. The contractor shall include as part of the base bid, sufficient labor hours to provide such exploration and field work throughout the duration of the project. Change orders for miscellaneous coordination of existing conditions will not be approved unless specific and latent conditions are uncovered that warrant such additional compensation or require additional work not shown on the drawings or included in the specifications, or implied by the designed conditions.
- D. New raceways and wiring to new and renovated equipment are to be installed unless otherwise noted. Where raceways are installed in accessible concealed locations (i.e. unfinished spaces or electrical / mechanical / attic spaces), EMT with wire shall be used. Where new wiring is required to be routed through existing walls and ceilings that cannot readily be accessible for new conduit, MC cable or flex conduit and wiring may be installed, fished through and secured in each space as required by Code. Non-metallic sheathed cable shall not be utilized on this project.
- E. All new raceways shall be installed concealed and all new equipment installed flush, unless otherwise noted on the drawings or in these specifications.

#### **1.11 GUARANTEE**

- A. This Contractor shall guarantee that all work executed under this Section will be free from defects of materials and workmanship for a period of one (1) year or as per the General Conditions of this project, whichever is longer. Dates shall be from the date of final acceptance of the building. The contractor shall further guarantee that he will, at his own expense, repair and replace all such defective work, and all other work damaged thereby, which becomes defective during the term of the guarantee. Such repair or replacement shall be guaranteed for one (1) year from the date of repair or replacement.

## 1.12 PERMITS AND INSPECTIONS

- A. Do not allow or cause any of the work to be covered or enclosed until it has been tested and/or inspected.

## 1.13 IDENTIFICATION

- A. Switchgear, switchboards, distribution panels, and feeder circuit breakers therein, panels, disconnect switches, motor starters, transformers, motor disconnect switches, cabinets, and other apparatus used for the operation of, or control of circuits, appliances or equipment, shall be properly identified by means of engraved laminated plastic descriptive nameplates mounted on apparatus using stainless steel screws. Nameplates shall have white letters with black background and be submitted to the Architect for approval. Cardholders in any form are not acceptable.
- B. Provide p-touch style labeling of circuit designations for all receptacles on the project.
- C. Each branch circuit of panel boards to have a permanently fixed number with load directory, mounted under celluloid on inside of cabinet door, showing circuit numbers and typewritten description of equipment supplied by breakers. Where changes are made to existing panelboards, newly typewritten circuit directories shall be prepared to replace existing directories.
- D. Provide label on all motors: "Caution. Automatic equipment. May start at any time."
- E. Provide silk-screened or engraved identification labels on all switch box covers identifying specific loads that are not readily apparent to the user, including electroshades, projection screens, exhaust fans, audio-visual controls, etc.. Submit proposed labels to Architect for approval prior to manufacture of labels.
- F. Provide identification of all pull boxes, junction boxes, and conduit stub-ups on the project as outlined below:
  - 1. For Power Feeders:
    - a. Stencil cover with identifying circuit number.
    - b. Lettering 1" high.
    - c. Color of lettering black.
    - d. Place lettering on cover in neat manner; run parallel to long sides of box.
  - 2. For branch circuits, grounding, communication, signal, and control systems boxes and blank conduit stub-outs:
    - a. Paint inside back of each j-box, front of each cover, and ends of each blank conduit stub-out with identifying system color as listed below:

1) 277/480-volt	Orange
2) 120/208-volt	Blue
3) Telephone/Data	Grey
4) Ground system	Green
5) Fire Alarm	Red
6) Lighting control	Orange/White
7) Clock/Speaker	Brown
8) Audio/Visual	Yellow
9) Security	White
10) Emergency Power 277V	Orange/Red
11) Emergency Power 120V	Blue/Red

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

- A. Refer to applicable Division 26, 27, and 28 Sections for complete products specifications.

### **2.02 MATERIALS**

- A. Materials of the same type or classification, used for the same purpose, shall be the product of the same manufacturer.

### **2.03 ACCEPTABLE MANUFACTURERS**

- A. Materials shall be of make mentioned elsewhere in this specification. All materials shall be the best of their several kinds, perfectly new and approved by the Underwriters' Laboratories.
- B. Where material, equipment, apparatus or other products are specified by manufacturer, brand name, type or catalog number, such designation is to establish standards of desired quality, style and utility and shall be the basis of the bid. Materials so specified shall be furnished under the contract unless changed by written approval of the Architect. Where two or more designations are listed, choice shall be optional with this Contractor, but this Contractor must submit his choice for final approval.

### **2.04 POSTED OPERATING INSTRUCTIONS**

- A. Furnish approved operating instructions for systems and equipment where indicated in the technical sections for use by operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal system and equipment. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions as directed. Attach or post operating instructions adjacent to each principal system and equipment including startup, proper adjustment, operating, lubrication, shutdown, safety precautions, procedure in the event of equipment failure, and other items of instruction as recommended by the manufacturer of each system or equipment. Provide weather-resistant materials or weatherproof enclosures for operating instruction exposed to the weather. Operating instruction shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

### **2.05 CATALOGED PRODUCTS/SERVICE AVAILABILITY**

- A. Materials and equipment shall be current products by manufacturers regularly engaged in the production of such products. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The 2-year period shall be satisfactorily completed by a product for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6,000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished. The equipment items shall be supported by service organizations which are reasonable convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Examine the areas and conditions under which the work of this Section will be installed. Correct conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Drawings:
1. The general arrangement and location of wiring and equipment is shown on the electrical drawings and shall be installed in accordance therewith, except for minor changes required by conflict with the work of other trades.
  2. The Contractor shall coordinate and verify all backbox, device, lighting fixture, or equipment mounting requirements with the devices or equipment to be installed, prior to rough in.
  3. Drawings indicate the circuit and panel which supplies each device or fixture. Provide and install conduit and conductors to make all connections from panel to nearest device and from first device to additional devices on same circuit. Conduit size and fill shall satisfy NEC requirements. Two or three different phases supplied by a 3-phase panel may share a single neutral only if circuit positions are adjacent in the panel. Do not exceed 4 #12 or 3 #10 conductors in a 1/2" conduit, 7 #12 or 5 #10 in a 3/4" conduit, and 11 #12 or 9 #10 in a 1" conduit, unless otherwise noted. Provide common handle-tie on breakers for multi-wire branch circuits (with common neutral), per NEC. If more than three current carrying conductors are installed in one conduit, conductor size shall be increased as required per NEC. Do not share neutrals for branch circuit runs to electronic equipment or where noted on the drawings.
  4. Drawings indicate the location of all light switches. Where fixtures in a room are controlled by more than one switch, the same lower case letter is drawn adjacent to a switch and each fixture controlled by that switch. Where no lower case letter is adjacent to a switch, all fixtures in the room are controlled by that switch. Provide and install conduit and wire from fixture to switch and between fixtures as required to accomplish switching shown. Do not route branch circuit wiring for light fixtures through switch boxes. Where dimming controls are specified, provide required dimming control wiring in addition to power wiring from control device to all controlled light fixtures. Provide separate conduit for dimming control wiring unless otherwise indicated on the drawings.
  5. Drawings indicate location of all signal outlet boxes. Provide and install conduit system as required and complete system wiring, unless otherwise noted.
  6. Control wiring is generally not shown on the plans. Contractor shall refer to control diagrams and provide and install all wiring and raceways required to make all interconnections.
  7. All branch circuit wiring No. 12 or No. 10 as noted, all control wiring No. 14, except as noted next to "slash marks" on the drawings, or as noted under "Wire," as specified herein.
  8. All dimensions, together with locations of doors, partitions, etc. are to be taken from the Architectural Drawings, verified at site by this Contractor.

9. Maintain "as-built" records at all times, showing the exact location of concealed conduits and feeders installed under this contract, and actual numbering of each circuit. Upon completion of work and before acceptance can be considered, this Contractor must forward to the Architect, updated CAD plans, corrected to show the electrical work as actually installed.
  10. All standard 20A branch circuit conductors shall be #12 minimum for up to 75 linear circuit feet, #10 minimum for up to 150 linear circuit feet, and #8 for runs longer than 150 feet.
- B. Measurements: Before ordering any material or closing in any work, verify all measurements on the job. Any differences found between dimensions on the drawings and actual measurements shall be brought to the Architect's attention for consideration before proceeding.

### **3.03 FIELD QUALITY CONTROL**

- A. All workmanship shall be first class and carried out in a manner satisfactory to and approved by the Architect.
- B. This Contractor shall personally, or through an authorized and competent representative, constantly supervise the work and so far as possible keep the same foreman and workmen on the job throughout.

### **3.04 COORDINATION**

- A. In electrical rooms, where electrical equipment is located at walls with brace framing, provide and install steel channel supports for mounting of electrical equipment away from wall to avoid conflict with brace framing. Steel channel supports shall be unistrut or equal, and shall include all channels, bases, fittings, etc., as required for a complete installation.
- B. In electrical rooms, Contractor is responsible for installation of electrical equipment within the space provided. Contractor shall provide ¼" scale plans of electrical room layouts, and elevations of steel channel supports (where used or required) of electrical equipment for review and approval prior to any installation or rough-in

### **3.05 INSTALLATION/APPLICATION/ERECTION**

- A. All electrical raceways and devices shall be installed concealed (for raceways) and/or flush mounted (for devices), unless otherwise noted. Provide cut-in boxes and "fish" flexible MC or flex conduit and wire through existing walls to remain, unless shown otherwise on plans. Cut and patch to facilitate such installation to match adjacent and original finish.
- B. All cutting, repairing and structural reinforcing for the installation of this work shall be done by the General Contractor in conformance with the Architect's requirements.

### **3.06 EMERGENCY POWER SOURCES**

- A. All emergency source circuits shall be installed in separate raceways (from normal power), per 2017 NEC 700.10(B), or the applicable code at the time of permitting.

### **3.07 TEMPORARY LIGHTING AND POWER**

- A. Provide and install temporary lighting and power systems for the duration of construction, of adequate size to accommodate the required lighting and power loads. Coordinate with other trades to insure adequate sizing.



- B. Provide distribution equipment as required to support all construction activities.

### **3.08 FIRE STOPPING AND FIRE RATED PENETRATIONS**

- A. All electrical equipment mounted in, on, or through fire rated construction shall be installed to maintain the fire rating of the construction.
- B. Provide fire rated pads (or other suitable assembly) around all electrical junction boxes in fire rated walls/ceilings/floors to maintain the fire rating.
- C. Provide fire rated construction around all recessed light fixtures and/or panel board / cabinets mounted flush in fire rated walls to maintain the fire rating. Coordinate depth of construction with other trades to avoid conflicts.
- D. Conduit sleeves shall be provided as a means of routing cables through fire-rated walls or floors. Openings in sleeves and conduits used for system cables and those which remain (empty) spare shall be sealed with an approved fireproof, removable sagging material. Sleeves which pass vertically from floor to floor shall be sealed in a similar manner using an approved re-enterable system. Additional penetrations through rated assemblies necessary for passage of tel/ data wiring shall be made using an approved method and permanently sealed after installation of cables.

### **3.09 ADJUSTING AND CLEANING**

- A. All electrical equipment, including existing equipment not "finish painted" under other sections, shall be touched up where finished surface is marred or damaged.
- B. All equipment, lighting fixtures, etc., shall be left in clean condition, with all shipping and otherwise unnecessary labels removed there from.

### **3.10 SCHEDULES**

- A. Coordination: Coordinate installation of electrical items with the schedule for other work to prevent unnecessary delays in the total Work.

### **3.11 WARNING SIGN MOUNTING**

- A. Provide the number of signs required to be readable from each accessible side, but space the signs a maximum of 30 feet apart.

### **3.12 PAINTING OF EQUIPMENT**

- A. Factory Applied: Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test, except equipment specified to meet requirements of ANSI C37.20 shall have a finish as specified in ANSI C37.20.
- B. Field Applied: Paint electrical equipment as required to match finish or meet safety criteria. Painting shall be as specified in the respective equipment section.

### **3.13 TESTS**

- A. Testing and inspection: See Section 26 08 00 - Testing.

**END OF SECTION**

## SECTION 26 0800

### TESTING

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Work Included in This Section: All materials, labor, equipment, services, and incidentals necessary to perform the testing and inspection of the electrical work, including but not limited to the general systems noted below:
1. Grounding system.
  2. Distribution system.
  3. Fire Alarm system.
  4. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the drawings.
  5. All work shall comply with Sections 26 05 00 and 26 27 00.
  6. In addition to the general system tests and inspections indicated above, the Contractor shall perform the following inspections and tests. The Contractor shall provide all material, equipment, labor, and technical supervision to perform such tests and inspections:
    - a. System Grounding.
    - b. Switchgear, Switchboards, Distribution Panels, Panelboards.
    - c. Feeders.
  7. The purpose of these tests is to assure that all tested electrical equipment is operational and within industry and manufacturer's tolerances and is installed in accordance with design specifications.

##### 1.02 APPLICABLE CODES, STANDARDS, AND REFERENCES

- A. All inspections and tests shall be in accordance with the International Electrical Testing Association - Acceptance Testing Specifications ATS-2021 (referred to herein as NETA ATS-2021).

##### 1.03 QUALIFICATIONS

- A. Qualifications of the Testing Firm shall be as listed in NETA ATS-2021.

#### PART 2 - PRODUCTS

##### 2.01 THIS ARTICLE DOES NOT APPLY TO TESTING.

#### PART 3 - EXECUTION

##### 3.01 GENERAL

- A. Final test and inspection to be conducted in presence of the Authority having Jurisdiction (AHJ) or Inspector of Record (IOR). Test shall be conducted at the expense of, and managed by, the Contractor, at a mutually agreed time. Submit written test report of all tests, with test result values and overall outcome.
- B. All portions of the electrical installation shall be inspected and tested to ensure safety to building occupants, operating personnel, conformity to code authorities and Contract Documents, and for proper system operation.

### 3.02 INSPECTIONS AND TESTS

- A. Tests: Field tests shall be performed and reports submitted, as per Section 26 05 00, Part 1.
1. Final Inspection Certificates: Prior to final payment approval, deliver to the Owner, with a copy to the Architect, signed certificates of final inspection by the appropriate local authority having jurisdiction.
  2. Grounding System:
    - a. All ground connections shall be checked and the entire system shall be checked for continuity. The resistance of grounding electrodes in the system shall be measured using a 3 point fall-of-potential method. The maximum ground resistance shall be three ohms. If the measured ground resistance exceeds three ohms, install (1) additional ground rod, bonded and interconnected with the grounding electrode system.
    - b. Ground tests shall meet or exceed the requirements of the National Electric Code.
  3. Power Distribution System:
    - a. Test main switchboard, distribution boards, panel boards, and transformers for grounds and shorts with mains disconnected from feeders, branch circuits connected and circuit breakers closed, all fixtures in place and permanently connected and grounding jumper to neutral lifted and with all wall switches closed.
    - b. Test each individual circuit at each panelboard with equipment connected for proper operation. Inspect the interior of each panel.
    - c. Check verification of color coding, tagging, numbering, and splice make-up.
    - d. Verify that all conductors associated with each circuit are in same conduit.
    - e. Demonstrate that all lights, jacks, switches, outlets, and equipment operate satisfactorily and as called for.
    - f. Perform megger tests of all new distribution system feeders prior to energizing. All Cables failing megger tests or with evidence of damage shall be removed and replaced in their entirety (no splices), at no cost to the Owner. Damaged cables may not be field repaired without specific approval of the Architect.
  4. Fire Alarm System: Verify that all equipment, components, and devices function as specified. Refer to Section 28 3101 for additional testing requirements.

**END OF SECTION**

**SECTION 26 2400**  
**SERVICE AND DISTRIBUTION SYSTEM**

**PART 1 - GENERAL**

**1.01 WORK INCLUDED**

- A. Work Included in This Section: All materials, labor, equipment, services and incidentals necessary to install the electrical work as shown on the drawings and as specified hereinafter, including but not limited to the work listed below.
- B. Temporary power for construction.
- C. Distribution Panels, Distribution System, Panel Boards, Grounding, and Overcurrent Protective Devices.
- D. All required incidental work, such as excavating, backfilling, testing, and temporary power.
- E. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the drawings.
- F. All work shall comply with Sections 26 05 00 and 26 27 00.

**1.02 RELATED WORK**

- A. Division 09 - Finishes
- B. Division 23 - Heating, Ventilating, and Air Conditioning

**1.03 SUBMITTALS**

- A. Comply with the provisions of Section 26 05 00 - Submittals.

**PART 2 - PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. Refer to Section 26 05 00, Part 2 - Products
- B. All new equipment shall match existing.
- C. List of Equipment Manufacturers:
- D. Switchboards and Motor Control Centers
  - 1. Eaton-Cutler Hammer, General Electric, Industrial Electric Manufacturing, Schneider-Square D.
- E. Panelboards and Distribution Panel
  - 1. Same manufacturer as Main Switchboard.

**2.02 MATERIALS**

- A. Provide and install conduits for primary cables by utility company, concrete pad and grounding for utility company transformer, and conduit for secondary service to main switchboard. Comply with all Utility Co. requirements.
- B. Furnish and install telecommunications service conduits and pullboxes; install conduits to main point-of-entry backboard as indicated on the drawings. All work shall conform to utility company requirements and to Section 26 27 00.
- C. Grounding:
  - 1. Provide and install grounding system as noted on the drawings.
  - 2. Grounding electrode conductor: bare stranded copper type, #4/0 minimum.

3. Install ground wires in rigid conduit.
4. All grounding electrode conductor connections "thermite" or "cad-weld" welded.
5. Use approved pressure type solderless connector or use fusion welding for all connections to and bonding of grounding electrode system. All connections shall be visible, readily accessible for testing purposes. Grounding electrode conductor between the grounding electrode and service equipment: Minimum #4/0.
6. Furnish and install solid copper or copper-clad 5/8" x 10'-0" ground rod(s). Where multiple ground rods are shown, install a minimum of 20'-0" apart. Install ground rods in accessible boxes with covers. Furnish and install 2-#4/0 bare copper cables between multiple ground rods and main switchboard ground bus.
7. Terminate grounding conduits at equipment with ground bushing, with ground wire connected through bushing.
8. Provide No. 12 stranded (green) THHN conductor from outlet box to ground screw of every receptacle.
9. Ground all isolated sections of metallic raceways.
10. Provide #12 minimum stranded (green) THHN conductor sized per NEC, or as noted, connected continuously throughout branch circuit for all circuits, bonded to panel ground bus, and to all electrical devices and equipment enclosures.
11. Grounding electrode installed as follows:
  - a. Place #4/0 bare copper cable in foundation trench; tensioned, supported in such a manner that it cannot be less than two (2) inches from bottom or side of concrete when foundation concrete is poured; not less than one hundred feet of conductor. Embed in foundation with a loop at approximate center, brought out at top of foundation at location of building service equipment for connection to service equipment and for bonding to other parts of the grounding electrode system.
  - b. Use approved pressure type solderless connector or use fusion welding for all connections to grounding electrode. Connection visible, readily accessible for testing purposes. Grounding electrode conductor between the grounding electrode and service equipment: Minimum #4/0.
  - c. Connect grounding electrode system to metallic water service entry metallic cold water pipe (if available) with nonferrous clamp and bare copper cable (sized as required) in conduit. Connection shall be accessible for inspection.
  - d. Connect grounding electrode system to effectively grounded building steel as indicated on the drawings. Use exothermic weld, connection shall be accessible for inspection.
  - e. After installation, test system using the three-point fall of potential method only. Record results and submit to Architect for approval. If resistance to ground exceeds three ohms, install an additional ground rod, bonded and interconnected to the grounding electrode system.
  - f. Connect ground bar of separately derived systems (e.g all dry-type transformers) to effectively grounded building steel at the closest possible accessible location, or if building is concrete, or the steel is not effectively grounded, to the main switchboard ground bus: Use #4/0 copper conductor for all connections.

D. Distribution Panels:

1. General: Switchboard shall be group-mounted type, metal enclosure with ground bus and insulated full capacity neutral bus.
2. Equipment:
  - a. The switchboard shall be braced for a short circuit current of 65,000 amps minimum, and for 100,000 amps when indicated on the drawings. Bracing shall be per NEMA and UL standards.
  - b. The switchboard shall comply with all the requirements of the Utility Company.
3. The switchboard shall be pad-mounted, self- supporting, dead-front and rear, front-operated, front-connected, distribution type. Nema 1 (indoor) or Nema 3R (outdoor). The enclosure shall be 90 inches high, made of cold rolled steel on a structural shape, or formed, steel frame and shall be mounted on two 3-inch, 5-pound continuous channel iron sills, which shall be closed at the ends between the two channels.
4. This contractor is responsible for the complete installation of the switchboard within the space provided (both vertical and horizontal) and shall verify and/or coordinate all dimensions prior to ordering equipment. Proper allowances should be included to allow complete installation and erection.
5. The switchboard shall be a minimum of 24 inches deep and shall be constructed of National Electrical Code (NEC) gauge steel.
6. For all switchboards or distribution panels rated 1,200 Amps or higher, provide an arc energy reduction measure in compliance with NEC 240.87(B), to reduce arc clearing time.
7. The switchboard shall be provided with a cable pull section at the top of the switchboard. Provide a minimum 12 inches of vertical clearance between the cable terminal lugs bolted to the switchboard busses and the top and bottom of the switchboard enclosure. Horizontal pull sections and gutters shall be kept free and clear of busses. Where busses cross vertical pull sections, the busses shall be insulated.
8. All connections between bus bars shall be of a bolted type using Belleville washers. Clamps will not be accepted. All bus bars shall be accurately formed, and all holes shall be made in a manner which will permit bus bars and connections to be fitted into place without being forced.
9. The design of all current-carrying devices or parts of the switchboard shall conform to the standard specified in the related sections of Underwriters' Laboratories, Inc. (UL) No. UL-891 and National Electric Manufacturer's Association (NEMA) Standard PB-2, except as these characteristics may be modified herein.
10. Bus bars, connection bars and wiring on the back of the switchboard shall be arranged so that maximum accessibility is provided for cable connections from the front.
11. Ampere ratings for rectangular bus bars shall be in accordance with the temperature rise standard of National Electric Manufacturer's Association (NEMA) and the Underwriters' Laboratories, Inc. (UL).
12. The enclosure shall be chemically cleaned by parkerizing, bonderizing or phosphorizing as a unit after all welding has been completed. The enclosure shall

then be painted with a rust- resisting primer coat of paint and shall be finished with a coat of light gray, baked enamel.

13. Each section shall be bussed for the full connected load of that section. Extend bussing to spare circuit breaker "Spaces." Drill busses for future circuit breakers, and provide breaker connector hardware where indicated on the drawings or where required for ready installation of future circuit breakers.
  14. Provide copper bus bars and connections with silver-plated contact surfaces.
  15. The contact surfaces and studs of all devices to which bus connections are made shall also have silver-plated surfaces.
  16. Provide a 200% rated neutral bus for switchboards supplied with 200% rated feeders (incoming or outgoing). Refer to single line riser diagram for feeder ratings.
  17. Locate ground bus, with a cross-section equal to at least 25 percent of the capacity of the main bus rating, in the back of the switchboard and extend bus throughout the length of the switchboard assembly. Ground each housing of the assembly directly to this bus.
  18. Rigidly support all bus and connection bars and current transformers.
  19. Fit all nuts and connections with locking devices to prevent loosening.
  20. Provide load connections with solderless lugs. Factory-install all devices shown on Drawings as specified herein.
  21. Properly identify the "high leg" of 4-wire delta connected systems as required by NEC 110.15 and 230-56.
  22. Provide ground fault protection for all main breakers or feeder breakers rated at 1000A or higher at 277/480V 3PH, and when otherwise indicated on the single line diagram or where otherwise noted on the drawings. Protection shall consist of a current sensor, relaying device, and the appropriately sized overcurrent protection device.
  23. Provide a bonding strap from the equipment ground bus to the neutral bus.
  24. Provide transient voltage surge protection, integral to or adjacent to the switchboard when indicated on the plans or where otherwise noted in the specifications herein. Refer to Section 26 43 00.
  25. Distribution Panels shall comply with all relevant requirements of the above paragraphs - minimum 12" deep, for floor or wall-mounting.
  26. The main switchboard or distribution panel shall include space for future electric vehicle charging station connection circuit breaker(s), with a label to identify the space(s) as "EV Capable", per California Green Building Standards Code.
- E. Panelboards:
1. Surface (or flush where indicated on the drawings) mounted, with branch circuits as indicated on the drawings.
  2. Enclosures: code gauge galvanized sheet steel with welded full flange end pieces, stretcher- leveled steel trim, backpan and door.
  3. Bussing of copper with silver-plated contact surfaces.
  4. Provide a 200% rated neutral bus for panels supplied with 200% rated feeders (incoming or outgoing). Refer to single line riser diagram for feeder ratings.
  5. Properly identify the "high leg" of 4-wire delta connected systems as required by NEC 384-3(e).

6. Trims on surface-mounted cabinets secured with nickel-plated screws with cup washers, bottom of all trims to have lugs for resting on cabinet flange.
7. Panels shall be 20 inches minimum in width, provided with approved gutter space, barriers and adjustable supports. Doors mounted with concealed hinges provided with combination spring latch and lock. Doors and trims and surface mounted cabinets primed and finished with one coat baked on gray enamel. All visible panel enclosures and covers in finished (occupied) areas shall be painted to match adjacent wall finish.
8. Breakers on same phase to be aligned horizontally. Each panel provided with quantity (5) spare handle locks. Install handle locks on all breakers serving fire alarm equipment.
9. Each branch circuit of panelboards to have a permanently fixed number with one word directory, mounted under celluloid on inside of cabinet door, showing circuit numbers and typewritten description of outlets controlled by breakers. Color code mains and each breaker terminal, same as conductor insulation.
10. Each panel shall be equipped with a copper ground bus.
11. All panels shall be fully bussed to accept future circuit breakers, with breaker hardware provided where indicated on the drawings.
12. Panel board submittals shall include diagrams of the circuit breaker arrangements in the panels. Arrange circuit breakers in panels exactly as shown on the panel schedules in the construction documents - no deviations permitted.

F. Circuit Breakers:

1. General: Circuit breakers shall be molded case rated for 480 or 240 volts, multiple or single pole and amperage rating as shown on the drawings, bolt on, manually operated with "de-ion" arc chutes.
2. For all circuit breakers rated 1,200 Amps or higher, provide an arc energy reduction measure in compliance with NEC 240.87(B), to reduce arc clearing time.
3. Main circuit breaker shall be shall be rated to interrupt the available short circuit current - 65,000 amps RMS unless otherwise indicated on the drawings.
4. Distribution circuit breakers shall be rated for the amps interrupting capacity noted on the drawings or U.L. series rated with the main circuit breaker.
5. Branch circuit breakers shall be rated for the amps interrupting capacity or U.L. series rated with the distribution and main circuit breakers, General Electric type THQB or equal, minimum 10,000 A.I.C for 120/208 volt; type TEY or equal, minimum 14,000 A.I.C for 277/480 volt.
6. Where mechanical equipment is U.L. listed for overcurrent protection with fuses or HACR type circuit breakers, provide fuses where a fused switch is shown. Where the overcurrent protection is a circuit breaker provide HACR, (Heating, Air-Conditioning and Refrigeration) type.
7. Provide switch rated type "SWD" circuit breakers were the circuit breaker is used as a switching device in a panelboard.

- G. Magnetic starters: shall be rated in accordance with latest published NEMA standards for size and horsepower rating, Eaton-Cutler Hammer A-200 series or equal. Provide with overload sensor in each phase, hand-off-auto switch, red "run" pilotlight, in NEMA 1, NEMA 4X, or NEMA 3R enclosure or in motor control center where indicated. Coil shall be rated 120 VAC. Starters shall be across-the-line nonreversing unless otherwise noted.



1. Contacts: Across-the-line magnetic starters shall be equipped with double break silver alloy contacts. All contacts shall be replaceable without removing power wiring or removing starter from panel. The starter must have straight-through wiring.
2. Coils: Coils shall be of molded construction. All coils shall be replaceable from the front without removing the starter from the panel.
3. Overload Relays and Thermal Units: Overload relays shall be the melting alloy type with a replaceable control circuit module. Thermal units shall be of one-piece construction and interchangeable. The starter shall be inoperative if the thermal unit is removed.

### **PART 3 - EXECUTION**

#### **3.01 REFER TO SECTION 26 05 00 FOR DETAILS OF WORK UNDER THIS SECTION.**

#### **3.02 INSTALLATION/APPLICATION/ERECTION**

- A. Switchboards and Distribution Panels Installation: Mount as detailed on the drawings.
- B. Motor Connections:
  1. Install motor circuits complete for all motors by other trades
  2. Furnish and install all disconnect switches, outlet boxes, etc., as required by code.
  3. All motor and temperature control low voltage wiring shall be installed and connected by Division 23 Section of specifications, unless otherwise indicated on electrical drawings.
- C. Motor Starters Installation:
  1. Deliver starters to site without thermal overload elements. Determine nameplate rating of each motor, after motor and starter installation, select thermal element rating from measured motor running current and install proper elements in starters.
    - a. Submit chart denoting motor designation, motor H.P., motor running current (N.P.), actual running current fuse/breaker size and thermal element catalog number. Take readings of motor running currents in conjunction with Division 23 - Heating, Ventilating, and Air Conditioning.

#### **3.03 TESTS**

- A. Testing and Inspection: See Section 26 08 00 - Testing.

**END OF SECTION**

## SECTION 26 2700

### BASIC ELECTRICAL MATERIALS AND METHODS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Work included in this Section: All materials, labor, equipment, services, and incidentals necessary to install the electrical work as shown on the drawings and as specified hereinafter, including but not limited to the work listed below:
  - 1. Raceways, feeders, branch circuit wiring, wiring devices, safety switches and connections to all equipment requiring electric service.
- B. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the drawings.
- C. All work shall comply with Section 26 05 00.

##### 1.02 RELATED WORK

- A. Division 09 - Finishes
- B. Division 23 - Motors and Mechanical Equipment Installation

##### 1.03 SUBMITTALS

- A. Comply with the provisions of Section 26 05 00.

#### PART 2 - PRODUCTS

##### 2.01 ACCEPTABLE MANUFACTURERS

- A. Refer to Section 26 05 00, Basic Electrical Requirements, Part 2 - Products.
- B. List of Equipment Manufacturers:
- C. Conduit and Conduit Fittings
  - 1. Allied Tube and Conduit, Wester Tube and Conduit, LTV Steel Tubular, National Electric Products, AFC, Republic Steel Corporation, Rome Cable Corporation, United States Steel Corporation, Killark Electric Manufacturing Company, Raco, VAW Aluminum Company, Bridgeport, Steel City, Thomas & Betts, Carlon, O.Z. Gedney, Appleton, Regal.
- D. Wire and Cable (600V)
  - 1. American Wire Company, General Wire and Cable Corporation, Okonite Company, Rome Cable Corporation, Cerrowire, American Insulated Wire, AFC Cable Systems, Essex, Simplex Wire and Cable Company, Southwire.
- E. Solderless Lugs and Grounding Connections
  - 1. Burndy Engineering Company Inc, O.Z. Gedney Company Inc, Penn Union Electric Corporation, Thomas and Betts Company Inc.
- F. Pull Boxes, Gutters, Special Cabinets
  - 1. Schneider-Square D Company, Columbia Electric Manufacturing Company, General Electric Company, Eaton Inc.
- G. Outlet Boxes
  - 1. Appleton Electric Company, Killark Electric Manufacturing Company, Lew Electric Fittings Company, National Electric Products Corporation, Raco, Steel City Electric Company, Carlon, Bowers.

- H. Floor Boxes
  - 1. Steel City Electric Company, Hubbell Inc, RCI, Walker.
- I. Wiring Devices
  - 1. Leviton, Arrow-Hart, Cooper, Hubbell, Lutron, Bryant.
- J. Conduit Racks, Hangers
  - 1. General Electric Company, Killark Electric Manufacturing Company, Caddy, National Electric Products Corporation, Republic Steel Corporation, Rome Cable Corporation, United States Steel Corporation, VAW Aluminum Company, Superstrut, B-Line.
- K. Safety Switches (Disconnect and Fusible)
  - 1. Schneider-Square D Company, Eaton-Cutler Hammer Inc, General Electric Company.
- L. Fuses
  - 1. Bussman Manufacturing Company, Chase-Shawmut Company.
- M. Firestopping
  - 1. 3M, Nelson.

## 2.02 MATERIALS

- A. Raceways: Only the raceways specified below shall be utilized on this project. Substitutions shall be pre-approved in writing. All bare conduit ends (stub-ups or stub-outs) shall be provided with bushed ends or manufactured insulated throat connectors:
  - 1. Rigid Type - hot dip galvanized or sherardized steel, use on all exterior locations, below grade or in concrete slab, and to 18" on either side of structural expansion joints in floor slabs, with completely watertight, threaded fittings throughout. Compression fittings are not acceptable.
    - a. All rigid steel conduit couplings and elbows in soil or concrete or under membrane to be ½ lap wrapped with Scotch #50 tape and threaded ends coated with T&B #S.C.40 rust inhibitor prior to installation of couplings.
    - b. ½ lap wrap all rigid steel conduit stub-ups from slab or grade to 6" above finished grade level with Scotch #50 tape.
  - 2. In lieu of rigid steel conduit for power and control raceways and branch circuit conduits in soil or concrete slabs, "Schedule 40" PVC with Schedule 80 PVC conduit elbows and stub-ups may be used with code size (minimum No. 12) ground wire. A "stub-up" is considered to terminate 6" above the finished surface.
    - a. Schedule 80 PVC conduit shall be used in all concrete footings or foundations and to 18" of either side of footings or foundation walls.
    - b. Schedule 80 PVC conduit shall be used in all concrete masonry unit (CMU) walls or columns.
    - c. All conduit runs in concrete floor slabs (where allowed) shall be installed to comply with all applicable CBC and structural codes to maintain the structural integrity of the floor slab. Where conflicts occur, alternate routing shall be provided at no additional cost to the Owner.
    - d. Where schedule 80 PVC is coupled to schedule 40 or other raceways with differing interior dimensions, each end shall be reamed with a reaming tool

- to reduce the edge profile for protection of the passing conductors during the pull.
3. Intermediate metal conduit may be used in all exposed interior locations, except that electrical metallic tubing may be used in some locations as noted below. Utilize steel compression type fittings for all exposed conduit runs, unless otherwise noted. Die-cast zinc fittings are unacceptable.
  4. Electrical metallic tubing shall be used exposed in interior electrical and mechanical rooms, in interior unfinished spaces, and in interior concealed and furred spaces, made up with steel watertight or steel set screw type fittings and couplings. EMT shall not be used in under-building crawl spaces or other areas subject to moisture. Set screws shall have hardened points. Die-cast zinc fittings are unacceptable.
  5. Surface mounted rectangular steel raceways and boxes: use for all surface mounted installations, unless otherwise noted (all catalog numbers listed are Wiremold - equals allowed) - color Ivory, unless otherwise noted;
    - a. #V500 for branch power runs on ceilings and walls (used with V500 series straps, elbows, connectors and V5000 series low profile boxes and covers).
    - b. #2000 or 2400 low profile for larger power run requirements on ceiling or walls (used with V2000 series straps, elbows, connectors and low profile boxes and covers).
    - c. #2400D for dual service power and tel/data run requirements (used with divided V2400 boxes and covers).
  6. Surface mounted rectangular non-metallic dual service raceways; Wiremold #5400 (Ivory) or equal with all required compatible activation covers, bezels, inserts, and blank plates for a complete installation. Refer to drawings for outlet quantities in raceway and feed points. All raceway fed flush from rear with horizontal j-boxes, unless otherwise noted.
  7. Use flexible conduit for all motor, transformer and recessed fixture connections, minimum ½"; "Seal tite" type used outdoors and in all wet locations, provide with code size (minimum No. 12) bare ground wire in all flexible conduit.
  8. All conduit cuts (factory or field cut) shall be perfectly square to the length of the conduit and cut ends shall be reamed with a reaming tool to provide a smooth edge to the passing conductors and to remove all burs and scrapes. Use of a hand file is not acceptable.
  9. All electrical raceways shall be installed concealed, unless otherwise noted. Cut and patch to facilitate such installation to match adjacent and original finish. All exposed conduits, where required, shall be installed parallel to building members.
  10. All emergency source circuits shall be installed in separate raceways (from normal power), per 2017 NEC 700.10(B), or the applicable code at the time of permitting.
  11. Where existing conditions preclude the installation of EMT in existing walls to remain, provide and install cut-in type boxes and "fish" flexible MC or flex conduit and wire through existing walls to remain, unless shown otherwise on plans.
  12. Fasten conduits securely to boxes with locknuts and bushings to provide good electrical continuity.

13. Provide chrome escutcheon plates at all exposed wall, ceiling and floor conduit penetrations.
  14. Support individual suspended conduits with heavy malleable strap or rod hangers; supports for 1/2 inch or 3/4 inch conduit placed on maximum 7-foot centers; maximum 10-foot centers on conduits 1 inch or larger.
  15. Support multiple conduit runs from Kindorf B907 channels with C-105 and C-106 straps.
  16. Conduit bends - long radius.
  17. Flash conduits through roof, using approved roof jack; coordinate with General Contractor.
  18. To facilitate pulling of feeder conductors, install junction boxes as shown or required.
  19. All empty conduits on the project shall be provided with a nylon pull rope to allow pulling of future conductors intended for the specific raceway. Provide plastic wire-tie style nameplate tags on each end of pull rope with printed identification of conduit use and the location of the opposite end of the rope. Pull ropes for telecommunications service conduits shall meet the utility company requirements.
  20. Where conduits pass through structural expansion joints in floor slab, rigid galvanized conduit shall be used 18" on either side of joint, complete with Appleton expansion couplings and bonding jumpers, or equal. All above grade expansion joint crossings shall also utilize expansion joint couplings or flex conduit transitions as required for each particular installation. Installed condition shall allow for a minimum deflection of raceway and wire (in any direction) equal to the structural expansion joint dimension (building to building). No solid conduits shall be allowed to cross expansion joints without proper provisions for building and seismic movement.
  21. Minimum cover of conduits in ground outside of building - 36 inches, unless otherwise noted.
  22. Provide and install exterior wall conduit seals and cable seals in the locations listed below. Coordinate installation and scheduling with other trades:
    - a. Conduit seals through exterior wall or slab (below grade): O.Z. Gedney series "FSK" in new cast in concrete locations, series "CSM" in cored locations.
    - b. Conduit seals through exterior wall or slab (above grade): O.Z. Gedney series "CSMI."
    - c. Cable seals at first interior conduit termination after entry through exterior wall or slab: O.Z. Gedney series "CSBI." Coordinate quantity of conductors at each location.
- B. Outlet Boxes and Junction Boxes. Verify all backbox requirements with devices to be installed prior to rough-in.
1. One piece steel knockout type drawn boxes, unless otherwise noted, sized as required for conditions at each outlet or as noted.
  2. Flush-mounted boxes equipped with galvanized steel raised covers for device mounting flush with finished surface. Provide extension rings as required on all acoustical or additional wall treatment areas to bring top of cover flush with finished surface (coordinate with architectural drawings). Devices shall be

- capable of being tightly mounted to boxes without distorting or bending device or mounting hardware.
3. Boxes for fixture outlets: 4-inch octagon or larger as required, or as noted.
  4. Switch and receptacle outlets - not smaller than 4-inch-square in furred walls, with raised cover for single device; ganged where required.
  5. Outlet and switch boxes for wet locations, cast aluminum FS or FD type with cast aluminum gasketed spring lid cover. Weatherproof "Bell" type boxes are not acceptable.
  6. All connectors from conduit to junction or outlet boxes shall have insulated throats. Connectors shall be manufactured with insulated throats as integral part. Insertable insulated throats are unacceptable.
  7. Outlet boxes for telecommunications, 4" square or larger as required or noted, multi-ganged for voice, data, and other services where indicated on the drawings.
  8. Conduit Bodies: Malleable iron type, with lubricated spring steel clips over edge of conduit body, O-Z/Gedney type EW, or equal.
  9. Floor Boxes:
    - a. Classification and Use: 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 National Electrical Code. Multi-compartment boxes 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.
    - b. Floor boxes shall provide flush or recessed device outlets that will not obstruct the floor area. Refer to Drawings for size and types. This specification covers concrete and wood frame floor applications with Wiremold 800, 860 and 880 and RFB Series boxes.
    - c. Cast-Iron Boxes: Box interior and exterior shall be painted. Boxes shall be available in 1,2, and 3 gang configurations. Boxes shall also be available in deep and shallow versions. Box shall provide 1-3/4 inches of pre-pour adjustment and 1/2 inch of post-pour adjustment.
    - d. Steel Boxes: Boxes shall be manufactured from stamped steel and formed. Boxes shall be available in 1,2, and 3 gang configurations. Boxes shall also be available in deep and shallow versions. All stamped steel versions shall provide 1-3/4 inches of pre-pour adjustment and 1/2 inch of post-pour adjustment.
    - e. Nonmetallic Multi-service Floor Boxes: Boxes shall be manufactured through the use of injection molded Geon M3900 PVC material. The box shall be rectangular in shape. Boxes shall allow for ganging of boxes together through a dovetail interlocking mechanism. Knockouts shall be provided on the side walls of each box to provide for pass-through capability between each gang. Boxes shall also have concrete depth markings on the exterior of the box to indicate box depth at the time of the pour. Boxes shall also provide graduated cubic inch markings on the interior of the box to indicate volume capacity at the appropriate box depth. Box shall accommodate concrete depths from 3-1/2 inches minimum to 6 inches maximum.

- 1) Floor boxes shall provide (2) 1-1/4 inch conduit openings to feed cabling to the box. Boxes shall provide the means to reduce this opening to fit 1 inch, 3/4 inch and 1/2 inch conduit sizes. Box shall be equipped with a high impact mudcap to protect the box from damage and prevent concrete entry during the pour and debris entry after the pour. Box shall also provide ratchet teeth along interior box walls to attach cover. Box shall include internal spacer to prevent deformation of the box sidewalls when high temperature additives are used in the concrete pour.
  - 2) Adjusting rings shall be used to attach flanges and covers to the floor box body. Adjusting ring shall have ratchet teeth to align with the teeth on box wall to connect box body without the use of adhesive or mechanical fasteners. Adjusting ring shall provide for 10 degrees of adjustment after concrete pour to adjust to various concrete conditions and floor finishes. Provide brass inserts to mount finish flanges to box body. Adjusting ring shall also provide for grounding locations using brass inserts.
  - 3) Adjusting ring shall provide the ability to accept a modular connectivity system. Modular communication inserts shall snap directly into the adjusting ring openings. Adjusting ring shall provide a fiber storage loop to maintain proper fiber optic bend radius control and excess fiber storage. Each adjusting ring shall except up to six connectivity activation locations. Adjusting ring shall allow modular connectivity inserts to be mounted recessed and protected when not in use.
- f. Covers and Flanges:
- 1) Floor box options shall accept aluminum, brass and nonmetallic cover plates and flanges.
  - 2) Flanges shall be available in one-, two-, and three-gang applications. Each flange shall provide 1/2 inches of adjustment to accommodate various floor coverings and concrete depths.
  - 3) Flanges shall accommodate connectivity outlets and modular inserts.
  - 4) Modular inserts shall snap directly into each flange using a mounting bezel.
- g. Multi-Compartment Boxes:
- 1) Boxes shall be fully adjustable, providing a maximum of 1-7/8 (RFB4) 2" (RFB9/RFB11) inch pre-pour adjustment, and a maximum of 3/4 inch post-pour adjustment.
  - 2) Boxes shall provide a series of device mounting plates that will accept both duplex power devices, as well as plates that will accommodate connectivity and AV outlets with modular inserts.
  - 3) The box shall provide 3/4", 1" and 1 1/4" conduit size openings with 2" KO for larger size boxes.
  - 4) Cover shall be cast aluminum. Lid shall be offered with solid, flush surface for tile, wood or terrazzo and an insert option for carpet inlay.
  - 5) Cover options shall support loads from 390LBS to 3000LBS
  - 6) Use cast iron boxes for on-grade applications (RFB4-CI-1). Stamped steel allowed for above grade applications (RFB-4 and RFB-4DB).

10. Pull boxes: All site pull boxes shall be flush in-ground concrete, with engraved covers identifying service use (i.e. electrical, communications, etc.). Boxes shall be Nema 250, Type 6, outside flanged, with recessed cover for flush mounting, by Christy or equal, with required depth to provide box and conduit depths shown or required.
  - a. Provide concrete covers for all boxes in planted or paved areas (up to available concrete cover size).
  - b. Provide galvanized steel covers for all larger boxes (when concrete is not available), or in traffic areas. No cast iron covers.
  - c. Provide bolted covers and slab bottoms (with grouted perimeter) or vault type boxes for all electrical distribution and signal system pull boxes used for site distribution, to prevent rodent entry. No collar type boxes with dirt or gravel bottoms
  - d. Provide drain hole at bottom of all vault type boxes, with loose aggregate base below, for proper drainage.
  - e. All covers to be completely flush with finished adjacent surfaces.
  - f. Provide galvanized steel H20 rated covers and installation of box rated for H20 in all traffic areas.
  - g. Provide pullboxes per utility company specifications for all electrical primary and secondary services and for telecommunications service runs. Verify exact size and type prior to order with each utility company.
- C. Wire and Cable (line voltage and signal systems):
  1. 600-volt class where used for or run with line voltage power wiring, insulation color coded, minimum No. 12 AWG for power branch circuits, No. 14 for power control circuits, and wiring size and type as directed by signal system manufacturer for each signal system.
  2. All conductors shall be copper.
  3. Size and insulation type:
    - a. Standard locations: #12 to #1 AWG: THWN for wet locations and THHN for dry locations. #1/0 through #4/0 AWG: XHHW (55 Mils). 250MCM and larger: XHHW (65 Mils). All wire sizes used shall be based on a 75 degree insulation rating, unless specifically used with 90 degree rated breakers and devices.
    - b. All wiring (power and signal) installed underground between buildings, or in wet or damp locations, shall be outside listed and rated for wet locations.
    - c. High temperature and non-standard locations: Provide wire type and insulation category suitable for area of use as defined in NEC table 310-13.
  4. Conductors No. 8 and larger and as otherwise noted on drawings shall be stranded. Power conductors No. 12 and No. 10 shall be solid or stranded. Power conductors No. 14 or smaller shall be solid.
  5. Provide signal system wiring for each system to meet the system manufacturers requirements and recommendations for each device or equipment type. Signal wiring systems shall be provided with shielding and/or insulation type and cable quantities as directed by the manufacturer, and meet all NEC requirements for locations used.
  6. Install all wiring branch circuits and feeders (low voltage and line voltage) in conduit unless noted otherwise on the drawings. Contractor shall mandrel all



feeders and pass a "sock" (or utilize other suitable means) through each raceway prior to pull to remove all water and construction debris. All raceways shall be completely clear of any obstructions or debris and all cut ends shall be reamed, prior to pull. Utilize pulling compound on all runs to insure minimum friction and pulling tension.

7. Megger test all feeders prior to energizing. See section 26 08 00 for additional information.
  8. Approximately balance branch circuits about the neutral conductors in panels.
  9. Connections to devices from "thru-feed" branch circuit conductors to be made with pigtails, with no interruption of the branch circuit conductors.
  10. Neutral conductor identified by white outer braid, with different tracers of "EZ" numbering tags used where more than one neutral conductor is contained in a single raceway.
  11. Neatly arrange and "marlin" wires in panels and distribution panelboards with "T and B Ty-rap" or approved equal plastic type strapping.
  12. All wire and cable shall bear the Underwriters' Label, brought to the job in unbroken packages; wire color-coded as follows:

a.	Voltage	Phasing	A	B	C	N
b.	120/208	3PH4W	Black	Red	Blue	White
c.	2083PH	3W	Black	Red	Blue	--
d.	277/480	3PH4W	Brown	Orange	Yellow	White
e.	4803PH	3W	Brown	Orange	Yellow	--
f.	120/240	3PH4W	Black	Red	Blue	White
g.	2403PH	3W	Black	Red	Blue	--
  13. The equipment grounding conductor shall be insulated copper; where it is insulated, the insulation shall be colored green.
  14. Label each wire of each electrical system in each pull box, junction box, outlet box, terminal cabinet, and panelboard in which it appears with "EZ" numbering tags indicating the connected circuit numbers.
  15. Properly identify the "high leg" of 4-wire delta connected systems (in each accessible location) as required by NEC 110.15 and 230-56.
  16. Provide permanently affixed adhesive labels with machine printed lettering (min. 1/8" high) at junction boxes serving fixtures that are supplied by (2) electrical sources (i.e. normal and emergency lighting). Label to read "CAUTION - This light fixture is powered by (2) separate sources. The normal power source breaker and the emergency power source breaker must be turned off before servicing this light fixture."
  17. Install feeder cables in one continuous section unless splices are approved by Architect. Exercise care in pulling to avoid damage or disarrangement of conductors, using approved grips. No cable shall be bent to smaller radius than the spool on which it was delivered from the manufacturer. Color code feeder cables at terminals. Provide identifying linen tags in each pullbox.
- D. Switches: Model numbers are Hubbell, color to be selected by architect, unless otherwise noted. All switches to utilize screw terminals for wire connections - no plug-in terminations:
1. Single Pole - No. HBL1221
  2. Two Pole - No. HBL1222

3. Three Way - No. HBL1223
  4. Momentary contact - No. HBL1557
  5. Momentary contact Keyed - No. HBL1556L
  6. Keyed, - No. HBL1221L
  7. Pilot Light (on with load on) - Hubbell No. 1221-PLC
  8. Motor Rated Double Pole (30A) - Hubbell No. 7832
  9. Motor Rated Three Pole (30A) - Hubbell No. 7810.
  10. Low voltage Data line switches - Refer to lighting control system (for compatibility)
- E. Receptacles: Mounting straps and contacts shall be one piece design, constructed of minimum .050" solid brass. Base shall be high strength, heat resistant, glass reinforced nylon. Device shall accept up to #10 wire, side or back wired with screw terminals - no plug-in terminations. Hubbell, Leviton, Pass & Seymore, or equal. Color to be selected by architect, unless otherwise noted. Numbers listed below are Hubbell:
1. 15A 3PG 125 volt duplex - No. HBL5262
  2. 20A 3PG 125 volt duplex - No. HBL5362
  3. 20A 3PG 125 volt ground fault interrupter receptacle; GFI receptacles shall conform to the 2006 UL requirements to a) interrupt power to the unit in the event of internal failure, or b) provide an audible or visual indication of internal failure of the GFI; No. GF20 or equal. Through wiring to down stream GFI designated receptacles is not acceptable.
  4. 15A 3PG 125 volt half controlled duplex receptacle - No. BR15C1(color), with permanent "controlled" marking, factory applied.
  5. 20A 3PG 125 volt half controlled duplex receptacle - No. BR20C1(color), with permanent "controlled" marking, factory applied.
  6. 15A 3PG 125 volt full controlled duplex receptacle - No. BR15C2(color), with permanent "controlled" marking, factory applied.
  7. 20A 3PG 125 volt full controlled duplex receptacle - No. BR20C2(color), with permanent "controlled" marking, factory applied.
  8. GFI Module (blank face), no indicator light, 20A - No. GFBF20 or equal.
  9. All receptacles located in exterior or wet locations shall be corrosion resistant with UV stabilized body.
  10. All receptacles in locations identified in NEC 406.12 (i.e. dwelling units, hotel/motel guest rooms, child care, preschool, K-12 schools, business office common areas, clinics, medical, and outpatient facilities, assembly area common areas, dormitory units, and assisted living units) shall be tamper resistant.
- F. Plates: Leviton, or equal, except as noted:
1. The color of all faceplates shall match the color of the devices installed under/in the faceplate, except as specifically noted otherwise.
  2. For flush outlet boxes, for switches, and receptacles: nylon, color to be selected by architect, unless otherwise noted.
  3. Plates for surface-mounted outlets: galvanized steel unless otherwise noted.
  4. Weatherproof duplex receptacle plates for exterior locations with ground fault interrupter receptacles in type FS or FD boxes - Hubbell #WPFS26 or compatible equal. Verify cover compatibility with box type and device installed.

5. Weatherproof "in-use" cover, vertical or horizontal mount, for exterior with GFCI receptacles. Die-cast metal alloy, TayMac MX series or equal with openings to match installed devices.
  6. Locking plates for duplex receptacles where noted; Pass & Seymour #WP26-L (non- weather proof).
  7. Locking plates for duplex exterior GFCI receptacles (or in wet or damp locations); Heavy duty cast aluminum flush cover with locking latch and key, Pass & Seymour #4600 with appropriate mounting plate for type of device installed. Coordinate backbox requirements and finished wall trim-out with wall installer prior to rough-in to insure an adequate and neat trim appearance upon completion.
  8. Plates for flush tele/data boxes: white nylon or as otherwise directed - provide and install at each tele/data outlet plate to match duplex power outlet plate, for jack installation under Section 27 00 00. Where the power and tele/data outlet boxes are shared the plate shall be continuous in multi-gang locations. See drawings.
- G. Equipment Disconnects: All disconnects shall be located to allow proper code required clearance in each area. Locations shown on drawings are diagrammatic only. The contractor shall coordinate exact locations in the field (with other trades) prior to rough-in to insure proper clearances.
1. Motor Disconnect Switches and Safety Switches: General Electric Company Heavy Duty Type "THD", cover interlocked with operating handle so that cover cannot be opened with switch in closed position and switch cannot be closed with cover in open position. 240V or 480V rating, single or multi-pole as required or as noted on drawings, in Nema 1 enclosure indoors or Nema 3R enclosure outdoors unless otherwise noted. Provide dual element motor circuit fuses sized as recommended by equipment manufacturer (for final equipment actually installed).
  2. Code required disconnects: Provide a local disconnect in addition to the branch circuit protection device for all equipment as required by code (whether shown or not). Disconnects shall consist of a motor rated switch (or disconnect) for all motor loads less than 3/4HP or other suitable disconnect sized to match branch circuit conductors and load current of equipment, with number of poles as required.
- H. Lugs and Connectors: Thomas and Betts "lock-tite", for No. 4 and larger wire; 3M "Scotchlock" fixed spring screw-on type wire connectors with insulator for No. 6 and smaller wire.
1. All splices shall be made up with screw-on type connectors - no plug-in or push-in style connectors acceptable. Wires shall be solidly twisted together with electricians pliers before screw-on connector is installed to ensure a proper connection in the event of wire nut failure. No exceptions.
  2. Connectors listed or labeled for "no wire twisting required" are not an acceptable substitute for actual wire twisting.
  3. Utilize porcelain type connectors in all high temperature environments (above 105 degrees Celsius).

- I. Splice Insulation: "Scotch" electrical tape with vinyl plastic backing or rubber tape with protective friction tape for interior work.
  - 1. Splices in electrical cables of 600 volt insulation class in underground system duct shall be made only in accessible locations such as pullboxes, light pole handholes, etc., using a compression connector on the conductor and by insulating and waterproofing (for exterior and underground locations) by one of the following methods:
    - a. Cast type splice insulation shall be provided by means of a molded casting process employing a thermosetting epoxy resin insulating material which shall be applied by a gravity poured method or by a pressure injected method. The component materials of the resin insulation shall be in a packaged form ready for convenient mixing after removing from the package. Do not allow the cables to be removed until after the splicing material has completely set.
    - b. Gravity poured method shall employ materials and equipment contained in an approved commercial splicing kit which includes a mold suitable for the cables to be applied. When the mold is in place around the joined conductors, the resin mix shall be prepared and poured into the mold. Do not allow cables to be moved until after the splicing materials have completely set.
- J. Identification: Refer to Section 26 05 00.
- K. Firestopping: as manufactured by 3M Fire Protection Products or equal.
  - 1. Fire-rated and smoke barrier construction: Maintain barrier and structural floor fire and smoke resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound vibration absorption, and at other construction gaps.
  - 2. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetration type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall penetrations. Systems or devices must be asbestos free.

### **PART 3 - EXECUTION**

#### **3.01 REFER TO BASIC ELECTRICAL REQUIREMENTS - SECTION 26 05 00 FOR WORK UNDER THIS SECTION.**

#### **3.02 TESTS**

- A. Testing and Inspection: See Section 26 08 00 - Testing.

**END OF SECTION**

## SECTION 28 3100

### FIRE ALARM SYSTEM WITH VOICE EVACUATION

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. This project shall include the furnishing, installation, connection, programming, commissioning, and testing of new fire alarm equipment required to form a complete coordinated system ready for operation at the project. Equipment shall be networked if indicated on the drawings. The fire alarm system shall include, but not be limited to, alarm initiating devices, alarm notification appliances, voice evacuation system, control panel (with multiple panels at different buildings networked together where indicated on the drawings, auxiliary control devices, annunciators at each building, power supply extender panels (as required), amplifiers, and all associated wiring (fiber optic network and copper system cabling).
- B. The system shall generally consist of a standalone fire alarm control panel with power supply extender panels and amplifiers at each building, or if indicated on the drawings a networked system with fire alarm control panels at each building, to control and operate all initiation and notification appliances at each building. The standalone fire alarm control panel shall include a digital dialer with off-site monitoring connection in order to identify the specific location of the control panel to the Fire Department. If a networked system is indicated on the drawings, each fire alarm control panel shall be identified for the specific building it controls and shall include a digital dialer with off-site monitoring connection in order to identify the specific building to the Fire Department. All panels at the facility shall be networked together in order to allow the central main fire alarm control panel (main FACP) to monitor each building on the site. Each building shall include a local LCD style annunciator. .
- C. Alarms/troubles at each building shall activate the local notification devices (or report troubles) at the respective building panel only and report the alarms/troubles to the main fire alarm control panel, but shall not activate other building notification devices.
- D. The system shall include an emergency voice evacuation alarm communication system. A digitized pre-recorded voice message shall notify occupants that a fire alarm condition has been reported. The message shall instruct the occupants with emergency instructions. All notification shall be speaker/strobes or strobe lights.
- E. The work shall include all required programming to allow proper sequence and operation as required by code. Final programming shall be done based on the actual physical room names and numbers used on site, if different from the room names or numbers on the approved plans.
- F. Provide CBC 2019 compliant seismic installation. See Section 26 0500 for all certification and submittal requirements.
- G. All work shall comply with Sections 26 0500 and 26 2700.

##### 1.02 SCOPE OF WORK

- A. This specification outlines the requirements for a microprocessor based, addressable (intelligent) automatic fire detection and alarm system. The system and components

shall be supplied by one manufacturer of established reputation and experience who shall have produced similar apparatus for a period of at least five (5) years and who shall be able to refer to similar installations in public buildings rendering satisfactory service.

- B. The work described in this specification consists of all labor, materials, equipment and services necessary and required to complete and program and test the automatic fire detection and alarm system. Any material not specifically mentioned in this specification or not shown on drawings but required for proper performance and operation shall be furnished, installed, and connected complete.
- C. Where a networked system is indicated on the drawings, the work shall include all required programming to allow network operation between each control panel, for central monitoring from the Main FACP.
- D. Final system programming (or re-programming for existing systems) shall be done based on the actual physical room names and numbers used on site, if different from the room names or numbers on the approved plans.
- E. The contractor shall contact the local fire department and/or emergency communications authority to obtain local testing and acceptance criteria for emergency radio responder criteria.
  - 1. Contractor is to provide testing of the facility to ensure the entire structure meets approved radio coverage for emergency responders within the building. Coverage shall be in accordance with California Fire Code (CFC) section 510. Testing shall be coordinated with, and witnessed by, the local Fire Department, and shall be performed by a certified qualified technician as defined in section 510.5.2 of the California Fire Code. Testing shall be performed at a time when the building structure, including ceilings and walls, is judged adequately complete by the Fire Department.
  - 2. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95% of all areas on each floor of the building meet signal strength requirements in sections 510 4.1.1 and 510 4.1.2 of the California Fire Code. Areas designated as vital, as determined by the Fire Department, shall have 99% coverage at signal strength required. Signal strength shall be measured on frequencies defined in section 510.4.2.2 of the CFC and as required by the Fire Department. Minimum signal strength of -95 dBm shall be receivable within the building and received by the agency's radio system outside the building, when transmitted from within the building.
  - 3. For passing tests, document the results of the test and submit with project close-out documentation.
  - 4. If the building/structure cannot support the required radio coverage, the Owner and the Architect shall be immediately notified, and a plan of action shall be put in place by the Owner and the design / construction team, for implementation of an augmented amplification system as required by section 510.4.2 of the California Fire Code.

### 1.03 REQUIREMENTS

- A. This installation shall be made in accordance with the drawings, specification and the following:
  - 1. National Electrical Code Article 760

2. NFPA Standard 72
  3. Local Codes and Authorities Having Jurisdiction
  4. ADA requirements and regulations.
- B. Fire Watch:
1. Provide an AHJ approved Fire Watch plan and Fire Watch for any portion of the fire alarm system that is left inoperative in a normally occupied building.
  2. At no time during the project shall a normally occupied building, or portion thereof that remains occupied, be left without a functioning fire alarm system, unless an approved Fire Watch is provided.
  3. Include all required planning and labor for a Fire Watch, where required.

#### **1.04 RELATED WORK**

- A. Division 26: Basic materials and methods
- B. Division 23: HVAC systems

#### **1.05 FIRE ALARM SYSTEM DESCRIPTION**

- A. The system shall be a supervised, non-coded, 24 volt DC, power limited system, networked if indicated on the drawings, and shall be capable of having all addressable initiation devices on the system in alarm at one time. Notification device circuits shall be wired Class B. Initiation device circuits shall also be wired Class B. A single ground or open on any initiating device circuit or notification appliance circuit shall not cause system malfunction, loss of operating power, or the ability to report an alarm.
- B. Provide initiation, notification and other devices as per specifications and indicated on drawings.
- C. Indicate alarms, supervisory, and trouble signals on the main fire alarm control panel and annunciator at each building and at the building fire alarm control panel in a networked system.
- D. Initiate signals to control (shut-off) HVAC system units and FSD's as per drawings and as required by code.
- E. Transmit alarm signals to off-site reporting agency via a digital communicator at each fire alarm control panel, with specific building address ID.
- F. The fire alarm system shall function as follows when any smoke or duct detector, waterflow switch, manual station or other initiating device operates:
  1. Operate required audible/visual and visual devices indicated on the drawings.
  2. Automatically notify off-site reporting agency.
  3. Indicate at the control panel alphanumeric display the number and location of the alarmed device.
  4. Light an indicating lamp on the smoke detector initiating the alarm.
  5. Light an indicating lamp on the remote annunciator indicating the location alarmed as well as the type of device alarmed (area smoke detector, duct detector, manual pull station, waterflow switch, kitchen fire suppression system panel, valve supervisory switch, etc.).
- G. Provide additional system features and capacities as indicated in Part 2 of this Section of the Specifications.

### 1.06 GUARANTEE

- A. All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance.

### 1.07 SUBMITTALS

- A. Submit fire alarm product data sheets in accordance with Division 1 and Section 26 05 00.
- B. Submit manufacturer's installation instructions including back-box requirements for each piece of equipment.
- C. Submit manufacturer's operating instructions and maintenance data.

### 1.08 APPLICABLE PUBLICATIONS

The publications listed below form a part of this specification.

- A. National Fire Protection Association (NFPA) - USA:
  - No. 70 National Electrical Code (NEC)
  - No. 72 National Fire Alarm Code
  - No. 101 Life Safety Code
  
- B. Underwriters Laboratories Inc. (UL) - USA:
  - No. 268 Smoke Detectors for Fire Protective Signaling Systems
  - No. 864 Control Units for Fire Protective Signaling Systems
  - No. 268A Smoke Detectors for Duct Applications
  - No. 521 Heat Detectors for Fire Protective Signaling Systems
  - No. 464 Audible Signaling Appliances
  - No. 1971 Visual Signaling Appliances
  - No. 38 Manually Actuated Signaling Boxes
  - No. 346 Waterflow Indicators for Fire Protective Signaling Systems
  
- C. Local and State Building Codes.
- D. All requirements of the Authority Having Jurisdiction (AHJ).



## 1.09 APPROVALS

- A. Fire alarm control panels and all peripherals shall have proper listing and/or approval from Underwriters Laboratory (UL) and be California State Fire Marshall listed and approved.

## PART 2 - PRODUCTS

### 2.01 EQUIPMENT AND MATERIAL, GENERAL

- A. All equipment and components shall be new, and the manufacturer's current model.
- B. The system shall be UL 864 (9th Edition) listed.
- C. Acceptable System Manufacturers:
  - 1. New systems; Notifier, District-preferred mfr.
- D. All equipment and components shall be installed in strict compliance with manufacturers' recommendations.
- E. All Equipment shall be attached to and ceiling/floor assemblies and shall be held firmly in place. (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

### 2.02 CONDUIT, BOXES, AND WIRE

- A. All conduit and wire shall comply with section 26 27 00 of these specifications.
- B. Conduit:
  - 1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.
  - 2. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.
  - 3. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
  - 4. Conduit shall be 3/4 inch minimum.
- C. Wire:
  - 1. All fire alarm system wiring shall be new and installed in conduit. All wiring shall be in conformance with fire alarm system manufacturer's requirements.
  - 2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760). Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 16 AWG for initiating device circuits and signaling line circuits, and 12 AWG for Notification device circuits.
  - 3. All field wiring shall be completely supervised, Class B for initiation loops, and Class B also for notification loops with end-of-line devices located as shown on the riser diagram.
  - 4. If indicated on the drawings, Class A loops shall be used for initiation circuits, and shall always include a return cable to the fire alarm panel terminals, per Class A and manufacturer's wiring requirements.
  - 5. All cable used in conduit outdoors or underground shall be Outside Plant Rated.
  - 6. Network communications loop shall be a 50/125 multi-mode fiber optic outside plant cable installed in inner-duct in the fire alarm site conduit and shall link all control panels if networked system is indicated on the drawings.

- D. Terminal Boxes, Junction Boxes and Cabinets:
  - 1. All boxes and cabinets shall be UL listed for their use and purpose.
  - 2. Outlet boxes for surface mounting shall be fire alarm listed use boxes with exactly the same size of the device. Standard galvanized outlet or j-boxes are not acceptable.
- E. Each Fire Alarm Control Panel and expander panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the power panel as FIRE ALARM and include a breaker handle lock for the dedicated breaker. Fire alarm control panel primary power wiring shall be #12 AWG. The control panel cabinet shall be properly grounded.

### 2.03 CONTROL PANEL

- A. The control panel shall be microprocessor based and totally power limited. The panel shall be capable of supporting Class A (Style 6) or Class B (Style 4) Network Communications lines, and Class A (Style Z) or Class B (Style Y) Notification Circuits. The panel shall have the following features; Totally Field Programmable, Password Access Protection, Built in Panel Diagnostics, Alarm and Trouble Resound, Alarm Event Buffer, Trouble Status Buffer, Point Identification Display, 24 hour Trouble resound, One Man Walk Test, Alarm Verification, and Positive Alarm Sequence. The panel (and expander panels where required) shall include audio amplifiers and related components to support the voice evacuation requirements. The panel shall have the following relays with a form C configuration; Alarm, Trouble, Supervisory, and Default Alarm Mode (to allow alarm reporting during microprocessor failure).
- B. The control panel shall be designed to monitor and process a minimum of 159 addressable inputs (smoke detectors, manual stations water flow devices, etc.), and up to 159 addressable monitor or control modules. The Network Communication Lines shall support various annunciation devices (i.e. LED Annunciators, Alphanumeric Displays, Printers) in addition to the addressable inputs and outputs described above. The system architecture shall allow for T-tapping of the Network Communications Lines. The use of a Zone Monitor module on the Communications Line shall further enhance the system with a master/slave concept, allowing a group of conventional detection devices (standard smoke detectors manual stations, waterflow and tamper switches) to be interfaced into the system as an address point. The system shall include individual power supply expander panels as required to support the notification loops. Each notification circuit shall be independently field programmable by the use of addressable control modules rated for the required current.
- C. The control panel shall contain an Alphanumeric Display interface which contains a microprocessor with a non-volatile memory to store field programmable alarm and trouble messages. The Alphanumeric Display shall consist of two 40 character lines for alarm, supervisory and trouble identification, and in quiescent mode, indicates system status.
- D. The control panel shall have history reporting, with the history stored in either the alphanumeric or printer modules. The history shall be at least 1,000 events. These events can be alarm, verification, supervisory, trouble, acknowledge, system reset, walk test, and the use of any panel keypad keys and access to any panel modes such as Program or Test.

- E. The control panel shall have self-diagnosis. Once the program is stored in memory and upon system initiating, if there is a discrepancy between the number of devices entered into the program and the actual number of devices connected to the system, the panel shall annunciate a trouble for the devices in question.
- F. Power Supply
  - 1. The Power Supply for the Fire Alarm Control Panel may be integral or external to the Fire Alarm Control Panel, and shall provide all control panel and peripheral device power needs. Additional power required to operate all alarm devices (above and beyond the capacity of the main panel supply) shall be provided with power expander panel(s), connected to the alarm output of the main control panel. Provide all required interface modules and relays for proper notification circuit operation as per manufacturer's instructions. Expander panel shall be as manufactured by the chosen Fire Alarm System manufacturer (qty. as required for full alarm operation).
  - 2. Input power shall be provided at 120 VAC, 60 HZ. The power supply shall provide an integral battery charger for use with a minimum of 12 AH batteries.
  - 3. It shall provide a minimum of 6.0 amperes of regulated 24 VDC power for Audio-Visual alarm notification devices, 200 mA of smoke detector power, and 200 mA of Non-Resettable power.
  - 4. The power supply shall be designed to meet UL and NFPA requirements for power-limited operation on all initiating and notification circuits.
  - 5. Positive-temperature-coefficient thermistors, circuit breakers, fuses, or other over-current protection shall be provided on all power outputs.
- G. Mechanical Design: The control panel shall be housed in a cabinet designed for mounting directly to a wall or vertical surface. The back box and door shall be constructed of .060 steel with provisions for electrical conduit connections into the sides and top. No conduit penetrations shall be utilized on the back or bottom of the panel. The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators. The cabinet shall be approximately 5 inches deep and 14.5 inches wide. Height shall be approximately 16 inches.
- H. The control panel shall have the exact model number and manufacturer's name indicated on the front panel cover.

#### **2.04 INITIATION DEVICES**

- A. Addressable photoelectric smoke detectors, (intelligent), shall be provided as indicated on the drawings, with features and characteristics as follows:
  - 1. The detector shall be self-compensating for ambient temperature and humidity.
  - 2. The detector shall be addressed, tested and programmed prior to installation using a UL listed programmer/tester. The detector readout shall yield a discrete electrical value for status tracking and logging for determining maintenance and cleaning requirements.
  - 3. The detector shall be suitable for two wire operation and two way communication on the intelligent analog signaling circuits.
  - 4. The detector shall display a flashing red LED when in the alarm state when the system is operating from normal or standby power.

5. The detectors furnished shall be listed for use in environments as covered by Factory Mutual, UL and shall be installed according to the requirements of NFPA 72 for open area coverage.
- B. Heat detectors shall be provided as indicated on drawings. Heat detector shall be of the rate compensation type, 135 degree.
- C. Manual stations, (intelligent), shall be single action and semi-flush or surface mounted as indicated on the drawings.
  1. The manual station shall be equipped with a terminal strip and pressure style screw terminals for the connection of field wiring.
  2. The manual stations shall be addressable and identifiable by the fire alarm control panel when they are resident on the analog loop. Address programming shall be accomplished electronically and reside within the station in non-volatile memory.
- D. A monitor module interface device shall be provided for required interface points such as water flow devices and tamper switches, or any contact type devices as indicated on drawings. This interface device shall have one or two Class B (Style 4) circuits as required.
- E. Provide a 120VAC circuit connection to each sprinkler system water flow bell (provided by Division 21). Wire power via the local water flow switch auxiliary contact to ring the bell upon water flow activation.

## **2.05 BATTERIES**

- A. Batteries shall be 12 volt, sealed type, with combined Amp-Hour ratings as required by Code.
- B. Battery shall have a minimum sufficient capacity to power the fire alarm system for not less than twenty-four hours in standby mode, plus 15 minutes of full system alarm upon a normal AC power failure.
- C. The batteries are to be completely maintenance free, no liquids required. Fluid level checks, refilling, spills and leakage control shall not be required.

## **2.06 NOTIFICATION DEVICES**

- A. Speaker / Strobe Notification Devices:
  1. All speakers shall operate on 70.7 VRMS, with field selectable output taps from 1/8 to 2 Watts in 3dB steps. Frequency response shall be a minimum of 400 HZ to 4 KHZ.
    - a. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements. All speaker tap settings shall be set per recommended settings (minimum 1/4 watt) for area coverage, and shall be re-tapped as required after final testing to provide adequate audible coverage throughout each area (to meet NFPA requirements).
    - b. Speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.
    - c. Provide amplifier modules as required to carry the full designed load, plus 20% spare capacity. Provide (1) additional back-up amplifier module for automatic back up of any failed amplifier module.

- d. Speaker/Strobe combinations shall be provided as indicated on Drawings. The speaker / strobe combination shall be Wheelock or equal, ADA and UL 1971 compliant (candela values as required) - white finish.
- B. Strobe Lights shall be provided as indicated on drawings. The strobe lights shall be either ceiling mounted, or wall mounted at +80" AFF or 6" below the ceiling level, whichever is lower, Wheelock or equal, ADA and UL 1971 compliant (candela values as required) - White finish. See drawings for locations.
- C. All devices in the gymnasium, multipurpose and locker rooms shall be provided with clear protective covers for vandalism protection. Provide protective covers as recommended by the manufacturer.
- D. Refer to Part 3 below for required synchronization of strobes when located in the same field of view.

## **2.07 AUDIO AMPLIFIERS**

- A. The Audio Amplifiers shall provide audio power at 70.7 Volts RMS for distribution to speaker circuits.
- B. Multiple audio amplifiers shall be mounted in the FACP, or at the FACP or expander panel locations, either to supply incremental audio power, or to function as an automatically switched backup amplifier(s).
- C. The audio amplifiers shall include an integral power supply, and shall provide the following controls and indicators:
  - 1. Normal Audio Level LED
  - 2. Incorrect Audio Level LED
  - 3. Brownout LED
  - 4. Battery Trouble LED
  - 5. Amplifier Trouble LED

## **2.08 AUDIO AMPLIFIER GAIN ADJUST**

- A. Adjustment of the correct audio level for the amplifier shall not require any special tools or test equipment.
- B. Amplifiers shall include audio input and amplified output supervision; back up input, and automatic switch over function, (if primary amplifier should fail).
- C. Amplifiers shall be backed up in groups (1 amplifier backs up several at the same location). Failure of any one amplifier in the system shall not degrade system performance in any way

## **2.09 AUDIO MESSAGE GENERATOR (PRERECORDED VOICE)**

- A. Each initiating zone or intelligent device shall interface with an emergency voice communication system capable of transmitting a prerecorded voice message to all speakers in the building.
- B. Activation of any alarm-initiating device shall cause a prerecorded message to sound over the designated speakers. The message shall be repeated a minimum of four (4) times.
- C. A built in microphone shall be provided to allow paging through speaker zone circuits.

- D. The audio message generator shall have the following controls and indicators to allow for proper operator understanding and control:
  - 1. All Call LED
  - 2. On Line LED
- E. All Call Switch Local Speaker Volume Control Local (Test) Speaker

## **2.10 SPEAKER CIRCUIT CONTROL SWITCHES / INDICATORS**

- A. The speaker circuit control switches/indicators shall include visual indication of active and trouble status for each speaker circuit in the system.
- B. The speaker circuit control panel shall include switches to manually activate or deactivate each speaker circuit in the system.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Installation, programming and testing shall be performed by current factory-authorized contractor of the specified system.
- B. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- C. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
- D. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.
- E. Provide identification labeling on all initiation and notification devices to identify loop and device number/address. Labeling shall consist of min. 3/8" black lettering on white background P-Touch style adhesive labels with machine printing, Helvetica font or similar.
- F. At the final inspection a factory trained representative of the manufacturer of the major equipment shall perform the tests in Section 3.3 TESTING.
- G. Wiring:
  - 1. See Part 1 of this Section of the Specification and the drawings for wiring requirements.
  - 2. When (3) or more visual notification devices are located within the same field of view and are less than 55 feet apart (within the field of view), all devices within that field of view shall be synchronized to provide the same flash rate and frequency. Provide all required sync modules and compatible strobe devices to provide a synchronized output.

### **3.02 PROGRAMMING**

- A. Provide system programming as required by code to provide a fully functional system. Final programming shall be done based on the actual physical room names and numbers on site, if different from the room names or numbers on the approved plans.

- B. Include changes to existing system programming (if existing), to accommodate the new devices and equipment, as well as any sequence of operation changes.
- C. When the device address(es) shown on plan is already programmed to an existing device, use another available address and show any changes or revisions on the as-built drawings during the project closeout.

### **3.03 TESTING**

- A. Refer to Scope of Work in Part 1 of this section for required emergency radio responder system testing requirements and documentation.
- B. Provide the service of a competent, factory trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system. Each building shall be separately tested as completed and where a networked system is indicated on the drawings, the entire networked system tested just prior to project completion. Include contractor pre-test for each building prior to the final AHJ testing to insure a suitable final test result.
  - 1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
  - 2. Close each sprinkler system flow valve and verify proper supervisory alarm at the respective FACP and/or annunciator.
  - 3. Verify activation of all flow switches.
  - 4. Open initiating device circuits and verify that the trouble signal actuates at the respective FACP and/or annunciator.
  - 5. Open and short all notification appliance circuits and verify that trouble signals actuate at the respective FACP and/or annunciator.
  - 6. Ground circuits and verify response of trouble signals at the respective FACP and/or annunciator.
  - 7. Check presence and audibility of tone at all alarm notification devices.
  - 8. Check installation, supervision, and operation.
  - 9. Verify that each initiating device alarm is properly received and processed by the respective FACP and annunciator (Walk Test).
  - 10. Conduct tests from each FACP to verify trouble indications for common mode failures, such as alternating current power failure.
- C. Test reports shall include, but not be limited to:
  - 1. A complete list of equipment installed indicating proper operations as listed above.
  - 2. Point print of all devices connected to all the FACP's.

### **3.04 FINAL INSPECTION**

- A. Final acceptance will require the contractor to deliver to the Owner the following;
  - 1. A single bookmarked PDF file of the operating instructions and system maintenance manuals.
  - 2. A single bookmarked PDF file of record drawings.
  - 3. A single bookmarked PDF file of the final test reports.
  - 4. A single bookmarked PDF file indicating the name and phone number of person to contact in the event of equipment failure, and date when system warranty will be terminate.

5. A single bookmarked PDF file of data sheets for each piece of equipment supplied.
- B. The fire alarm system notification audibility and intelligibility shall be tested and approved prior to final acceptance. Verify that all occupied spaces in the buildings are provided with adequate audibility and intelligibility of the temporal 3 alarm tone and voice evacuation recorded message. Test to be conducted in the presence of the IOR, who will provide acceptance of test outcome. Provide, install, and test additional alarm devices as required, if any deficiencies are noted.

### **3.05 GUARANTEE**

- A. See Part 1 of this Section of the Specifications.

### **3.06 INSTRUCTION**

- A. Provide complete instruction manuals and training to the building personnel. "Hands-on" demonstrations of the operation of all system components and the entire system shall be provided.

**END OF SECTION**



**SECTION 32 3113**  
**CHAIN LINK FENCES AND GATES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Posts, rails, and frames.
- B. Wire fabric.
- C. Gates and related hardware.
- D. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 8113 - Sustainable Design Requirements.
- C. Section 03 3000 - Cast-in-Place Concrete: Concrete anchorage for posts.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/ A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2011.
- C. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric; 2011.
- D. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2013.
- E. ASTM F1665 - Standard Specification for Poly(Vinyl Chloride)(PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence; 2008 (Reapproved 2013).
- F. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.
- G. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- H. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California amendments.
- I. California Code of Regulations, Title 24, Part 11, California Green Building Standards Code, "CAL-Green".

**1.04 SUBMITTALS**

- A. See Section 01 3300 - Submittals, for submittal procedures.
- B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware. Demonstrate compliance with specified attributes.
- C. CAL-GREEN Submittals: Product Data – VOC Limits: For adhesives sealants, fillers, primers and coatings, documentation including printed statement of VOC contents, comply with limits specified in related section.

- D. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Include accessories, hardware, gate operation, and operational clearances.
- E. Samples: Submit two samples of fence fabric, slat infill, 8 inch by 10 inch in size illustrating construction and colored finish.
- F. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation anchor bolt templates, and \_\_\_\_\_.
- G. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines \_\_\_\_\_.

#### **1.05 FIELD CONDITIONS**

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

#### **1.06 WARRANTY**

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences, gates and operators that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to comply with performance requirements.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - c. Faulty operation of gate operators and controls.
  - 2. Warranty Period: Five years from date of Substantial Completion.

#### **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. VOC Limits for adhesives, sealants, fillers, primers and coatings . Comply with limits specified in related section.
- B. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7. Design shall account for added wind resistance from privacy slats and windscreen fabrics where these items are shown on the drawings.
  - 1. Design Wind Load: As indicated on Drawings.

2. Minimum Post Size and Maximum Spacing: As indicated on Drawings and as determined according to CLFMI WLG 2445, based on mesh size and pattern specified, except that if drawing details conflict with CLFMI WLG 2445, provide larger posts and closer spacings as detailed.

## 2.02 MANUFACTURERS

- A. Chain Link Fences and Gates:
  1. Master-Halco, Inc: <https://www.masterhalco.com/#sle>.
  2. Builders Fence Company: [www.buildersfence.com](http://www.buildersfence.com)
  3. Merchants Metals: <https://www.merchantsmetals.com/#sle>.
  4. Substitutions: See Section 01 6000 - Product Requirements.

## 2.03 MATERIALS AND COMPONENTS

- A. Materials and Components: Conform to CLFMI Product Manual for structural performance as specified.
- B. Fabric Size: CLFMI Standard Industrial, Heavy Residential service and as specified below.
  1. Top and bottom selvage knuckle ends closed
  2. Chain Link Fabric 2 inch mesh, 6 gauge, 0.148 in. diameter steel wire core, height as shown on Drawings, except if no height is shown, provide 5'-0" height.
  3. Polymer coated steel chain link fabric per ASTM F668, Class 2b Fused and adhered to metallic coated steel wire.
    - a. Color of chain link fabric per ASTM F934, Black.
  4. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
- C. PVC Color Coated Steel Fence Framework.
  1. Framework color to match fabric.
- D. Intermediate Steel Posts: Type I round.
- E. Fittings
  1. All fittings to be PVC thermally fused color coated having a minimum thickness of 0.006" per ASTM F626. PVC color to match fabric and framework. Moveable parts, nuts and bolts to be field coated with PVC liquid touch up after installation.
  2. Post caps: ASTM F626 galvanized pressed steel, malleable iron, or aluminum alloy weather tight closure cap for tubular posts. Provide one cap for each post. "C" shaped line post without top rail do not require post caps. When top rail is specified provide line post loop tops to secure top rail.
  3. Rail ends: Galvanized pressed steel per ASTM F626, for connection of rails to post using a brace band.
  4. Top rail sleeves: 7" galvanized steel sleeve per ASTM F626. [If expansion and contraction of the rail is of concern, add a 0.137" wire diameter by 1.80" long expansion spring between the adjoining rails]
  5. Wire ties: 9 gauge (0.148") galvanized steel wire for attachment of fabric to line posts and rails. Alternate double wrap 13 gauge (0.092") galvanized steel wire for rails and braces. Pre-formed hog ring ties to be 9 gauge (0.148") galvanized steel or aluminum for attachment of fabric to tension wire. Tie wire and hog rings PVC coated and in compliance with ASTM F626. Color to match fabric color.
  6. Brace and tension (stretcher bar) bands: ASTM F626 galvanized 12 gauge (0.105") pressed steel by 3/4" formed to a minimum 300 degree profile curvature for post attachment. Secure bands using minimum 5/16" galvanized carriage bolt and nut.

7. Tension (stretcher) galvanized steel bars: One piece lengths equal to 2 inches less than full height of fabric with a minimum cross-section of 3/16" x 3/4" ( per ASTM F626. Provide tension (stretcher) bars where chain link fabric is secured to the terminal post.
8. Truss rod assembly: Galvanized steel minimum 5/16" diameter truss rod with pressed steel tightener, in accordance with ASTM F626
9. Carriage bolts and nuts: Galvanized of commercial quality

F. Tension Wire

1. Tension wire: Poly Vinyl Chloride (PVC) coated metallic coated steel tension wire per ASTM F 1664 7 gauge steel core wire, 0.177" PVC coating class and color to match chain link fabric.

G. Concrete: Type specified in Section 03 3000.

## 2.04 CHAIN LINK SWING GATES

- A. Swing gates, single and double leaf types where indicated, height of gate to equal height of fence.
  1. Gate Width: As shown on Drawings, except if no dimensions are shown then provide single leaf type minimum 48 inches wide and double leaf gates 96 inches wide, (48 inches per leaf).
  2. Fabricate chain link swing gates of welded construction with gate frame members spacing no greater than 8' 0" apart horizontally or vertically, in accordance with ASTM F900. Exterior members to be 1.900 inch OD pipe, interior members shall be 1.660 inch OD pipe. PVC coated pipe to be Grade 1 ASTM F1083.
  3. Chain link fabric to match material of fence. Stretch fabric tightly and secure to vertical outer frame members using tension bar and tension bands spaced 12 inches on center and tied to the horizontal and interior members 12 inches on center using 9 gauge galvanized steel ties.
- B. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.
- C. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.

## 2.05 ACCESSORIES

- A. Privacy Slats: High density virgin polyethylene, stable color pigment with ultraviolet inhibitors, 25 year limited warranty against color fading and breakage of slats and locking-channel used under normal climactic extremes experienced in North America and Hawaii. Color: Black. Standard PDS self- locking using horizontal bottom channel locking system.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install framework, fabric, accessories and gates as indicated and in accordance with ASTM F567.
- B. Place fabric on inside of posts and rails.
- C. Set intermediate and other posts plumb, in concrete footings with top of footing 6 inches below finish grade. Slope top of concrete for water runoff.

- D. Line Post Footing Depth Below Finish Grade: ASTM F567, minimum and deeper as shown on drawings and to resist imposed loads as specified.
- E. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567, minimum and deeper as shown on drawings and to resist imposed loads as specified.
- F. Brace each gate and corner post to adjacent line post with horizontal center brace rail \_\_\_\_\_. Install brace rail one bay from end and gate posts.
- G. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
- H. Provide bottom rail at transformer and mechanical equipment enclosures and athletic backstops.
- I. Install center brace rail on corner gate leaves.
- J. Do not stretch fabric until concrete foundation has cured 2 days.
- K. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- L. Position bottom of fabric 2 inches above finished grade.
- M. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- N. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- O. Install bottom tension wire stretched taut between terminal posts.

### 3.02 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.
- B. Do not attach the hinged side of gate to building wall; provide gate posts.
- C. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.

### 3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.
- C. Do not infringe on adjacent property lines.

### 3.04 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

**END OF SECTION**